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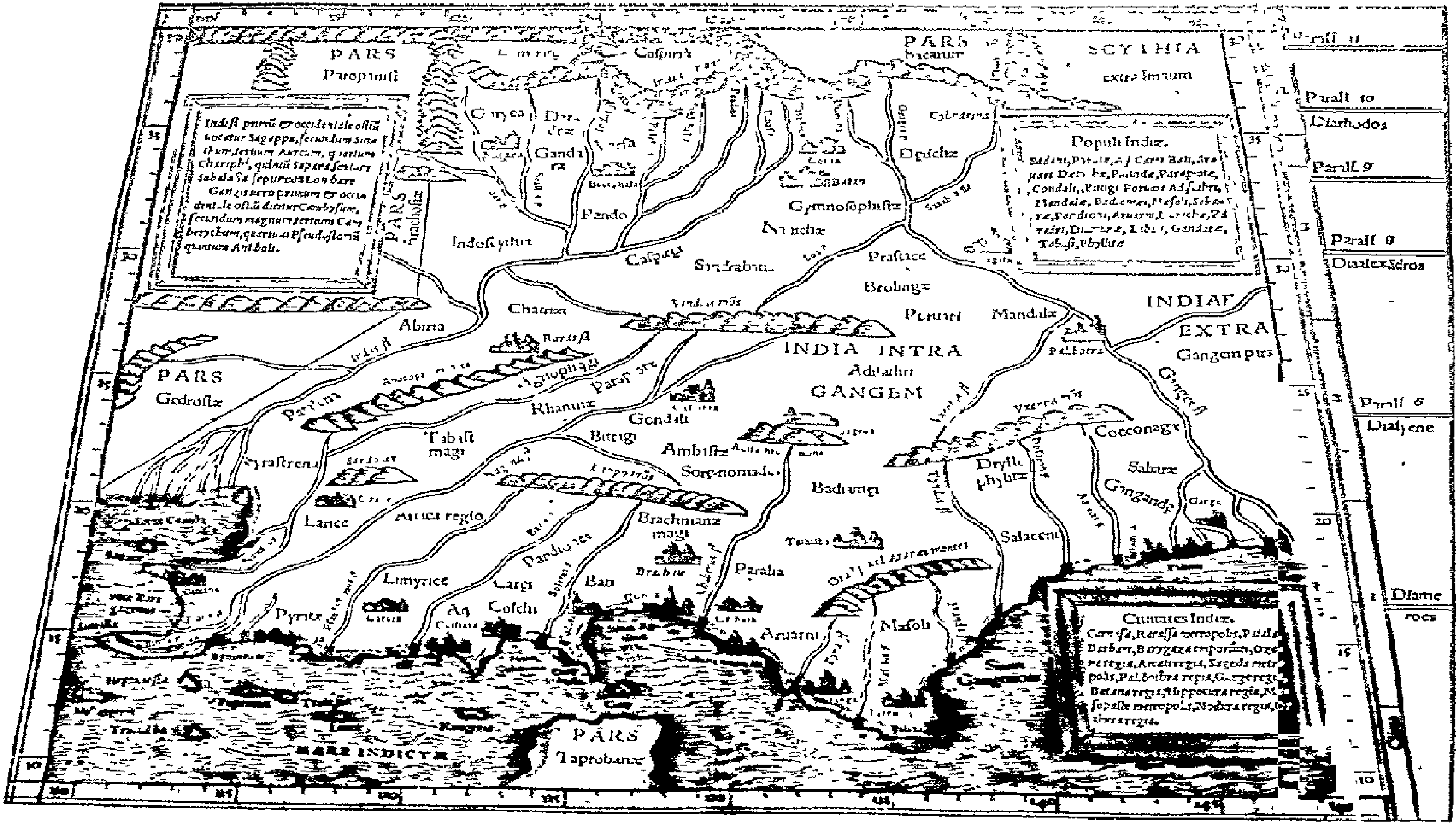
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EARLY MAPS OF INDIA

Susan Gole

FOREWORD BY PROF. IRFAN HABIB

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in association with
ARNOLD-HEINEMANN

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For my parents who also collect

early maps

and encouraged me to write this book

Foreword

I feel greatly privileged in introducing to the reader Mrs Susan Gole's excellent collection of the early European maps of India (sixteenth to eighteenth centuries). So far as I know, it is the first time that an attempt has been made to bring together a representative selection of such maps We can trace in the maps the study of the progress from Ptolemy's admixture of phantasy and reality, to the painstaking accuracy of the late eighteenth century maps. Mrs Gole earns our gratitude further by giving a comprehensive catalogue of the maps of India printed between 1513 and 1795. Undoubtedly, no list can be perfect; but it is likely that no important map has escaped Mrs Gole's notice. The text that she provides gives a succinct account of the way the information collected was transferred to the maps. She also discusses the value, and limitations, of the work of the more prominent cartographers

Mrs Gole has concerned herself almost wholly with European map-making. This is logical in that the modern maps of India trace back their pedigree entirely to European map-making of the sixteenth century. The traditions of map-making in India and the eastern countries that existed earlier have had no effect on modern cartography.

But it may be worthwhile 'to restore the balance' by inviting the reader's attention to two sets of maps in Persian.

Hamdullah Mustaufi made a notable change in 'Islamic' map-making when he made a map based entirely on coordinates of various places as determined by the best authorities available to him. He made two maps for his *Tarikh-i Guzida* (1329-30) and *Nughatu-l Qulab* (1339-40), one of Iran, and the other of the world (Eastern hemisphere) Needham does Hamdullah some injustice by interpreting his map of Iran as a grid map; it is explicitly a plate carré, with a vertical

side of each square representing a degree of longitude, and a horizontal side, a degree of latitude. As far as India is concerned, Mustaufi takes the notable step of depicting it as a peninsula, a recognition of its true shape not vouchsafed to European map-makers until much later.

The other set of maps is still more significant from our point of view It is an atlas of the 'Inhabited Quarter' (northern hemisphere above the Equator), beginning with a map of the Quarter, followed by 33 'sheets', all based, like modern sheets, on divisions according to degrees of latitude and longitude. The Atlas forms part of an encyclopaedia in Persian completed by Sadiq Isfahani at Jaunpur (U.P., India) in 1647. The entire Atlas is preserved in a copy of the larger work in the British Museum (Egerton 1016; the atlas comprises ff.335 a to 351 a). Sadiq explains the symbols used in his maps like any modern map-maker (vermillion for rivers and sea, wavy lines for mountains). India is covered in six sheets. These six sheets not only give a tolerably recognisable shape of India, but put Sadiq in advance of contemporary European map-makers in that his Ganga (Ganges) and Jamuna represent quite closely their true courses

To return from this digression to Mrs Gole's fascinating story of European maps of India.

She shows us how the map-makers' progress was not a simple one of filling in spaces as additional information came in. A number of pitfalls beset their endeavour. An error may be perpetrated because of wrong information or faulty guess-work. But as one cartographer copied from another, the error would become a dogma, and go on disfiguring the maps, until at last the error was discovered and denounced. The north-south course given to the Ganges, discussed by Mrs Gole, is an outstanding example of such errors.

One other important source of error lay in the inability to fix longitudes properly, whereas latitudes could be determined with some certainty This remained true until the coming of the chronometer. But apart from the inherent difficulty experienced in fixing the longitude of a place, the fact that the prime meridian used by European observers and map-makers was that of Paris or Greenwich must also have caused considerable confusion

Had a place in India been accepted for fixing 0° long. for maps of this region, it would have been much easier to determine longitudes of places within it in relation to the place on the prime meridian. No

longitude could naturally be determined directly in relation to any place in Western Europe In actual fact, since the map-makers accepted degrees of longitude worked out by different observers for different cities on the basis of assumptions of different longitudes (E. of the prime meridian in Europe) for other cities, the confusion was compounded, and grotesque distortions of the geography of inland regions were a natural result. Rennell took the commonsense decision of taking as his prime meridian the longitude of Calcutta for his *Bengal Atlas*, and this probably played no little part in contributing to the greater accuracy of his maps.

I have made these remarks incidentally, as these and other questions arose in my mind while reading Mrs Gole's text. Undoubtedly, anyone who closely sees her reproductions of early maps would have still other matters to reflect on, such as the projections used by the map-makers, the deviation in their maps from the true scale; the evidence they offer of river-courses as they existed in earlier periods, and so on.

I feel sure that anyone curious about the history of cartography, as well as a student of Indian historical geography, would find much to arrest his attention in Mrs Gole's excellent volume

Aligarh
17 July 1976

Irfan Habib

Preface

Maps of any date and place are fascinating things. Many of the ly ones, made before any aerial survey was imaginable, were largely result of guesswork and hearsay. Later, land measurements were sible and by the middle of the nineteenth century most of the world l been fairly accurately surveyed. To the lover of the quaint and the ious these later maps have lost a large part of their charm. It is the ly maps, drawn before the invention of an exact chronometer owed a proper calculation of degrees of longitude, which fascinate their honest attempts and their inconsistencies. Mention must also made of those printers and publishers who made and sold early nts long after the geographers had supplied better knowledge. But s only adds to the charm of discovering a picture of a country as it s imagined by the men of long ago.

My interest in maps dates from a chance visit to Kensington ace in London. I found myself returning again and again to the tches of London as it was some three or four hundred years ago. The t day I went to a shop specialising in maps and asked to see some of lia. The assistant reeled off names and dates, but when I consulted a k on cartography, I found that maps of India merited only half a ge The collection and study of early maps is well developed in some ts of the world, but so far maps of India have received scant ention. Yet they are an invaluable source for historians and an ect of delight to a collector.

I have not been able to find any maps of India made before the vent of the Europeans. Geographical treatises there were, both in lia and the Middle East But the idea of a pictorial representation

was either absent, or very rudimentary among the Arab geographers. Consequently a story of the mapping of India becomes a study of the men who came to India by sea or land and went back to report their journeys, so that the cartographers could put down their discoveries in a pictorial fashion.

I am grateful to Professor Irfan Habib for writing a Foreword, and Dr Romilla Thapar for reading the manuscript and making valuable suggestions I would also like to thank Map Collectors Circle for permission to reproduce my catalogue of printed maps. This catalogue does not claim to be exhaustive, but it is a basis on which further work can be done.

My intention in writing this book has been to share the fascination I have found in early maps, so that more people may come to have some regard for them, both as objects of study and as works of art, pictorially and scientifically.

New Delhi, 1976 *Susan Gole*

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Introduction

The art of making maps has been known to man from the earliest times. Most primitive communities had maps of one kind or another but unfortunately very few of them have survived Even from later periods those that have come down to us are mostly the ones that were preserved in collections as works of art Early travellers and sailors relied more on the directions they heard from others than on a pictorial view of the route they planned to take.

The earliest world maps that have survived are copies of those made by Ptolemy in the second century A.D. Working in the library of Alexandria he was able to study the geographical theories of the world that had been propounded over the previous four hundred years. His book on geography was translated into Latin in 1409 and copies of the maps were first printed in Bologna in 1477. It was in a way an immense step forward in the knowledge of the world, yet also the esteem in which Ptolemy was held preserved his errors for too long a time His maps were reprinted forty times in the next two hundred and fifty years.

In the meantime in western Europe symbolic maps of the world were being drawn under the influence of the church in the shape of a small circle. Also, for more practical use, sailors made their own charts, at first of the Mediterranean Sea, which came to be called Portolanos Many of these charts were beautifully drawn with fairly exact knowledge of the areas frequented by the sailors. Later they were elaborated to include the new lands as they were discovered. They gradually developed into objects of great beauty, fit to be presented to a king, a great improvement over the early seaman's chart drawn for his own use

The invention of the printing press brought maps within the reach of a much wider public. At that time the woodcut was the recognised

medium for book illustration and most of the early maps were printed for inclusion in books of travel or geography By this method the design to be inked was left in relief, all other parts of the block being cut away This made it easy to cut separate blocks for the lettering of the names which could then be fitted into the outline. Also, as the maps were printed in combination with the written page, they could be passed through the press at the same time

Copper-plate engraving was used earlier in Italy, and later became the common method throughout the continent. Here the lines were incised with a fine tool on the copper plate, allowing greater freedom of design and fineness of detail. The plate was then inked, wiped, and passed through the press with a sheet of damped paper, which drew up the ink from the incised lines. This method was particularly popular for the large sheet maps. The work was much faster than the carving for a woodcut, and it was easier to produce varying textures to mark the different features of the land.

Until the nineteenth century maps were coloured by hand. The publishers employed artists for this purpose, and several mapmakers started their careers as junior illuminators. They followed a conventional pattern in the colours they used, just as the symbols for the various topographical features were well known. Thus if the maps were correct, it was possible to tell whether a particular town was fortified, in which direction a range of mountains had a more gentle slope, or, from the careful depiction of the ships, which way the trade winds normally blew

At first printed maps were produced and sold at the same place Booksellers sold only their own maps, rarely those of others. By the sixteenth century, with the increased demand for maps, many publishers supplied those engraved by others, or copied from earlier maps Bookfairs were held at many places, where there was wide interchange of books and maps from the different countries. Schools of mapmaking grew, and the centre of the cartographic industry moved from Italy to the Netherlands and later to France and England.

Map production was never a cheap process. Even to re-engrave a map already printed elsewhere took time. To construct a new map from the latest geographical knowledge was a much more arduous task In a time of rapid discovery publishers were not prepared to dispense with their plates if the maps could still find a market Hence

many out-dated maps were reproduced alongside newer ones. If they were required purely as wall decorations this did not matter much. But when they were needed for actual use in the field, it was essential that the latest knowledge should be shown correctly. Hence, surveys were begun, governments took a hand in their production, and gradually a true picture of the world appeared.

I. Fabulous Ind

India was always a remote exotic place Though known to the other early civilizations of the world, the culture, habits and philosophy were developed independently, and in a particularly Indian manner. The vast civilization of the Indus Valley, which is now known to have been wide-spread throughout northwest India, had trading contacts with west Asia—but the religion and architecture were distinctly Indian The script has not yet been deciphered, but it is obviously not akin to the other scripts of the period Whenever the Aryan migrations took place, the newcomers were soon absorbed into the local culture and background, so that they too developed differently from the other branches of the same stock.

Between these early centres of civilization in India and the Middle East a large amount of trade must have been carried on of which we now have little record. The earliest mention of India in extant Greek texts is from Hecataeus, 500 B C, quoted by Herodotus in 443 B.C, in which he says that India is the most populous nation on earth and rich in gold Beyond India lie only uninhabitable deserts[1] Herodotus also recorded that King Darius of Persia sent a man called Scylax on a thirty month journey, with instructions to sail 'eastwards' up the Indus and bring back full accounts of the people and the country. Unfortunately we know nothing of the reports he brought back but may assume that they contained lengthy details of the fabulous wealth of the Indian kings.

This fabled wealth encouraged the young Alexander, king of Macedonia in northern Greece in the fourth century B C, to attempt conquest of the known world—as far as the Great Bay (of Bengal). During the sixth century B.C Cyrus, the Achmaenid emperor of Persia had crossed the Hindu Kush mountains and was receiving tribute from the provinces of north-west India. Thus Alexander wanted to include

all the Achmaenid empire within his sway. He was also keen to discover the 'world Ocean', which geographers had postulated, but no one knew exactly where it began. He led his army through Persia and Afghanistan and crossed the Jhelum and Chenab rivers. He went no further than the Beas, not because of local opposition, but because his troops refused to march in the summer heat, and the monsoon was fast approaching. It is not known why he chose the months of May and June for this advance; it was possibly due to faulty intelligence about the climate, or to the fact that he could not control a restless army far from its home if he were to wait for the cooler months. He promised his men that they were on the way home and led them south to the mouth of the Indus There he divided the army into two and led one part back overland, ordering Nearchus to sail home with the remainder through the Arabian gulf.

This 'conquest' is barely mentioned in the Indian literature of the period, but it was a major advance in the European knowledge of India. It opened up the trade routes, as Alexander left local governors in the provinces he had passed through, and there were strong cultural influences in both directions. With Alexander went geographers and historians who were instructed to make detailed reports and precise measurements everywhere they went. The measurements of the daily marches made by Amyntas were later confirmed by Megasthenes who visited Chandragupta Maurya at Pataliputra as ambassador for the Bactrian king Seleucos Nikator. The work of these geographers was simplified when they found that the Indians already had precise and accurate knowledge of their own country It was easy to obtain details of towns, rivers and mountains much beyond the territory covered by Alexander's army

All this knowledge was put to good use in the first known maps of India that have survived in some form to the present day. From Alexandria in the second century A.D. came the *Geographia* of Ptolemy—a long geographical treatise accompanied by maps of the known world There had been a famous school of geography at Alexandria for a long time, and the learned Eratosthenes is also recorded as being a mapmaker there several centuries earlier. But it is to Ptolemy that medieval geographers gave the credit for being the first cartographer Yet Ptolemy's map of India, Tabula Asiae X (Plate 1), as copied by Munster in 1540, is hardly recognizable. The acute

angle made by the two coasts of the peninsula meeting at Cape Comorin is ignored completely, with the result that the coast of India is shown as an almost straight line running east-west between the mouth of the Indus and that of the Ganges Yet considering how little of the country was traversed by Alexander's army, the amount of topographical detail is surprising. The Ganges is clearly marked, rising in the Imaus mountains (Himalayas) and flowing into the Sinus Gangeticus (Ganges Bay) through a wide delta. Palibotra, ancient Patna and the centre of the Magadha empire of the fourth century B C , is shown below the conflux of the Son and the Ganges. The major mountain ranges are all depicted, looking like twisted ropes. Most of the Latin names have been identified by scholars, and the map is surprisingly accurate for the period in which it was drawn, except for the miscalculation of the long coast line

Ptolemy's mistake was due to three reasons. Firstly, he calculated 500 Olympic stadia to a degree of longitude, instead of six hundred. As the distance from his known world increased so did the margin of error Secondly he allowed for too great an excess of distance for land journeys over sea journeys Living in the port of Alexandria, he must have talked to many sailors who had visited the ports of south India, yet his map gives no idea of the long coastline All places that were determined by land measurements were reckoned too far to the east, thus elongating the east-west line and grossly foreshortening the north-south distances. Lastly, taking his measurements from Cairo and Alexandria, he did not take into account the fact that Cape Comorin is almost two thousand miles south of Cairo, and consequently the distance between the meridians is much greater He does not seem to have agreed with the measurements of Pliny and Arrian, who gathered more correct information from the works of Strabo and Megasthenes. His maps were drawn from three known lines, the coast line from Cambay to the Ganges delta, the course of the Indus and the gulfs of Cutch and Cambay, and the road from Punjab to the Ganges delta. The towns and provinces he had heard about are placed correctly in relation to each line, but at too great a distance from it, thus distorting the map as a whole.

Ptolemy's *Geographia* appears to have been ignored by European geographers until the fifteenth century, when the encroachments of Islam and finally the fall of Byzantium forced many scholars to flee

westwards. However, it was translated into Arabic in the eighth century and al Idrisi made use of it in his world map of the twelfth century Maps by a sixth century traveller, Cosmos Indicopleustes, have also survived but they were grossly distorted by his religious views.

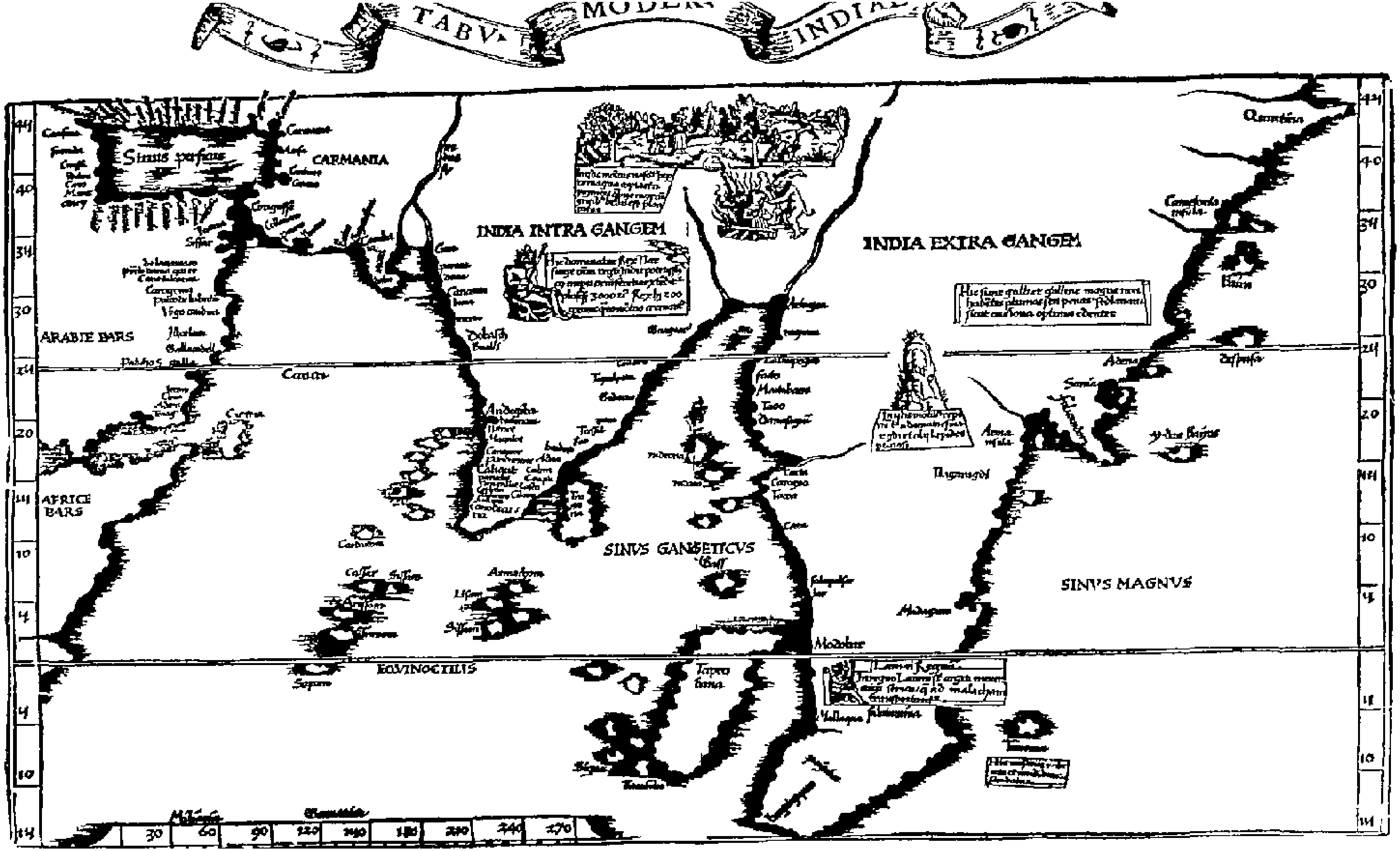
The Greeks made one more attempt to have direct contact with India. King Euergetes II, of the Greek dynasty of the Ptolemies ruling in Egypt, sent Eudoxus out in 115 B.C with a castaway Indian pilot whom he had restored to health after a shipwreck. They reached the Malabar coast safely and returned with a rich cargo of spices and precious stones, which were immediately grabbed by Euergetes as his share of the profit from the voyage. In disgust at receiving nothing for himself, Eudoxus set off again, but was obviously not successful a second time, as no more was heard of him

The Romans traded extensively with India, and established trading stations along the west coast. In fact there was such a drain of silver from Rome that Pliny complained about it in the Senate. There was a great demand for goods from India, but there was nothing from Rome that the Indians would take in exchange except gold and silver.

The merchandise from India was received at the port of Berenike on the west coast of the Red Sea. The early route for journeys in both directions was to keep close to the coast Legend credits Hippalus with being the first to sail directly across the Arabian Sea to Mouziris (Cranganore), but the Arab sailors must have been making use of the monsoon currents from a much earlier date Pliny records that the boats left Berenike about mid-summer, sailed to the mouth of the Arabian Gulf, and then took forty days to reach Mouziris. The return voyage began in December, under a northeast wind until the boats entered the Arabian Gulf and met with a south or southwest wind. Thus, he triumphantly recorded, the complete voyage could be made in less than a year[1]

The early Christian church also maintained contacts with India for some time. St. Thomas the Apostle travelled overland to the Persian Gulf and then took passage in a Moor's ship to south India. He established churches in south India and in Sind, and they kept in touch with Rome through the Syrian church at Aleppo In 883, King Alfred of England made a vow before one of his battles that if he were successful he would send someone to the holy church of Rome, and

2 Munster s new map of Asia for his edition of Ptolemy 1540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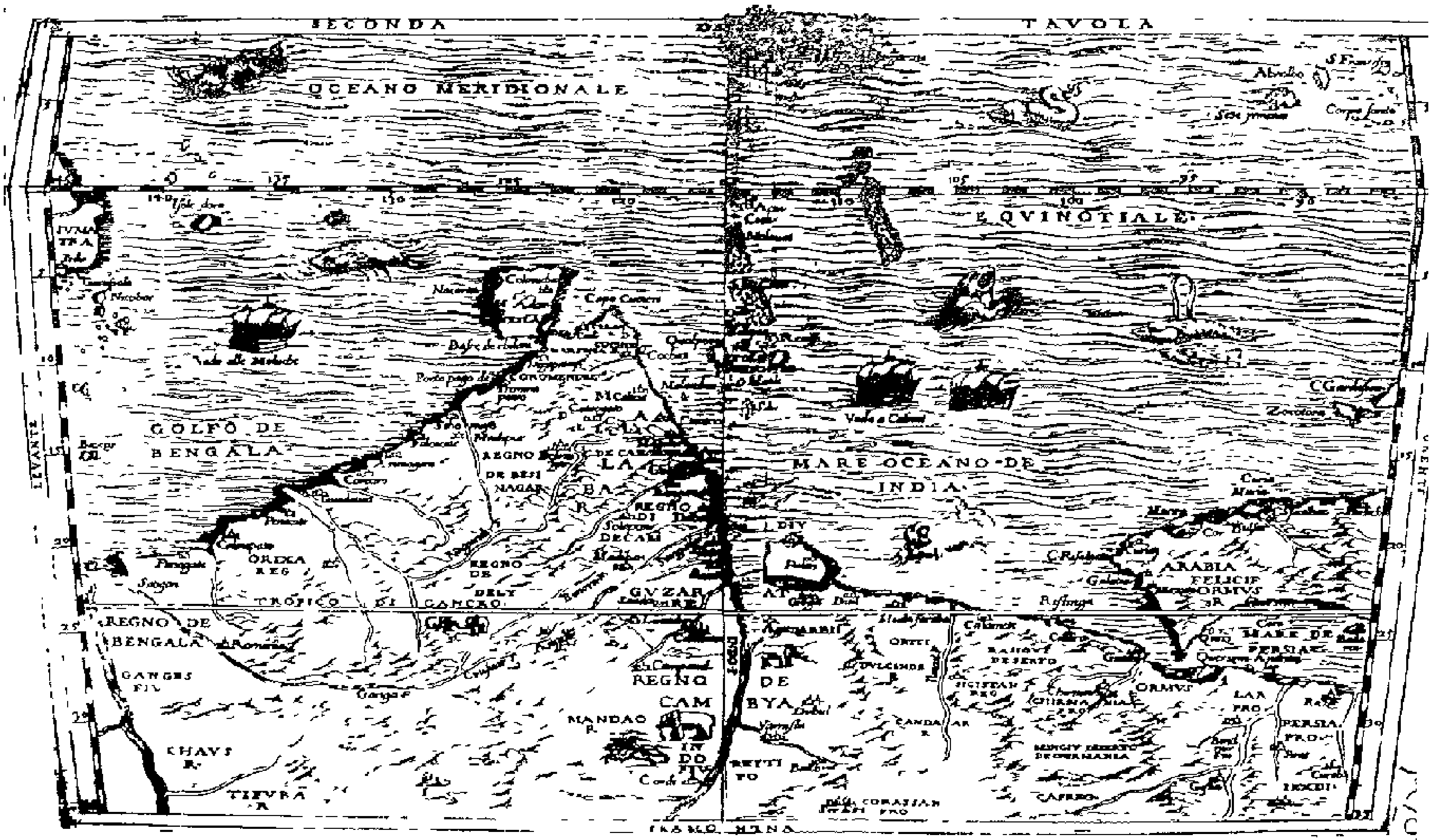


5 Gastaldi's map for Ramusio's book of travels, 1565

also to the churches of India. Accordingly, after the victory, he sent the bishop of Sherborne. How Bishop Sigelm travelled or by which route is not known, but it is surprising that Alfred knew about the Christians in India at all. William of Malmesbury, writing in 1125, records that Alfred 'sent many presents oversea to Rome and to St. Thomas in India. Sigelm, bishop of Shireburn, sent as ambassador for this purpose, prosperously penetrated into India; a matter of astonishment even in the present time. Returning thence, he brought back many brilliant and exotic gems, and aromatic juices, in which that country abounds.' During the intervening two hundred years, from Alfred's time to that of his biographer, the routes through the Middle East had been closed to western travellers, which explains the historian's surprise that Alfred's envoy had not only travelled to India, but also returned safely.

Ebn Haukel, the Arab geographer of the tenth century, travelled widely and had better firsthand knowledge of India, but as Abul feda wrote: 'The book of Ebn Haukel is a work of considerable length, in which the different countries are described with sufficient exactness. But neither are the names of places marked by the correct points, nor are the longitudes or latitudes expressed, this frequently occasions an uncertainty respecting the places and proper names.' However, Ebn Haukel left maps of Sind and Hind, in which geometrical precision is more prized than geographical location, hence they are difficult to recognize. He made no commentary or map for the further parts of India, as he found the people to be infidels or Idolators, and therefore not worthy of record!

The work of another Arabic mapmaker has fortunately survived. Al Idrisi was born at Ceuta in north Africa in 1100 A.D., and he travelled widely over western Europe before being invited by Roger II of Sicily to make his home on that island. This invitation was probably more on political grounds than for scientific or geographical reasons, as Idrisi was a claimant to the Moorish throne and had not at that time become famous as a geographer. Using Ptolemy's outline he had difficulty fitting in his better knowledge of India. His map shows a land-locked Indian Ocean, an idea of great advantage to the Arabs. This fallacy was maintained by Arab merchants as long as possible, ensuring them a monopoly of the rich trade from the Indies.

The works of some other Arabic, or more correctly Persian,

geographers have come down to us. But it is disappointing that, with their opportunities for travel, and the knowledge of science gained from India, they did not develop the art of mapmaking. The most notable in the tenth century was Abu Zaid who made an atlas of twenty-one maps, which were copied by Istahri and Mukaddasi. From the next century al Biruni left a detailed account of most of India He lived at the court of Mahmud of Ghazni and accompanied him on his raids into India Later came al Kazwini who was a scholar of law, geography and natural history But these men were geographers, not cartographers and they did nothing to improve the cartographic art

From the opposite direction, India had many visitors from China. They came in search of knowledge of the Buddha and to copy manuscripts of his teachings. The earliest known reference to India in Chinese writings, from the second century B.C., mentions Yan-tu, or Yin-tu, meaning Hindu, and Shin-tu, meaning Sindhu Fa-Hien, in the early fifth century A.D, wrote that the country is narrow towards the south and broad towards the north, like the faces of the inhabitants. After Hiuen Tsang's extensive travels in the middle of the seventh century, maps were made in China to illustrate his book, the Si Yu Ki. India was then divided into five parts, hence the maps refer to the Five Indies, or Gotenjiku Zu The oldest extant map was copied by Jukai, a Buddhist priest, in 1364. It shows a pear-shaped continent called Jambudvipa, lying to the south of Mount Sumeru. In the centre is Lake Anavatapta (Manasarovar), from which flow four rivers, the Ganges, the Indus, the Oxus and the Tarim The places visited by Hiuen Tsang are marked and his route is shown in red Chinese maps followed this prototype, due to strong religious authority, until they came under the influence of the Jesuit Matteo Ricci in the sixteenth century. A world map by Hotan in 1710 first shows India as a pointed peninsula and as part of the other countries of Asia

Thus we see that during the period when most of Europe was still groping its way out of the Dark Ages, there was some knowledge of, and contact with, the more developed civilization of India But geography itself was still not established as a science, and the practical use of maps was largely unknown. Merchants and travellers planned their journeys on hearsay and the experience of others. Literacy, anyway, was not wide-spread and the few books obtainable were the work of monks laboriously copying manuscripts in the monastery. It

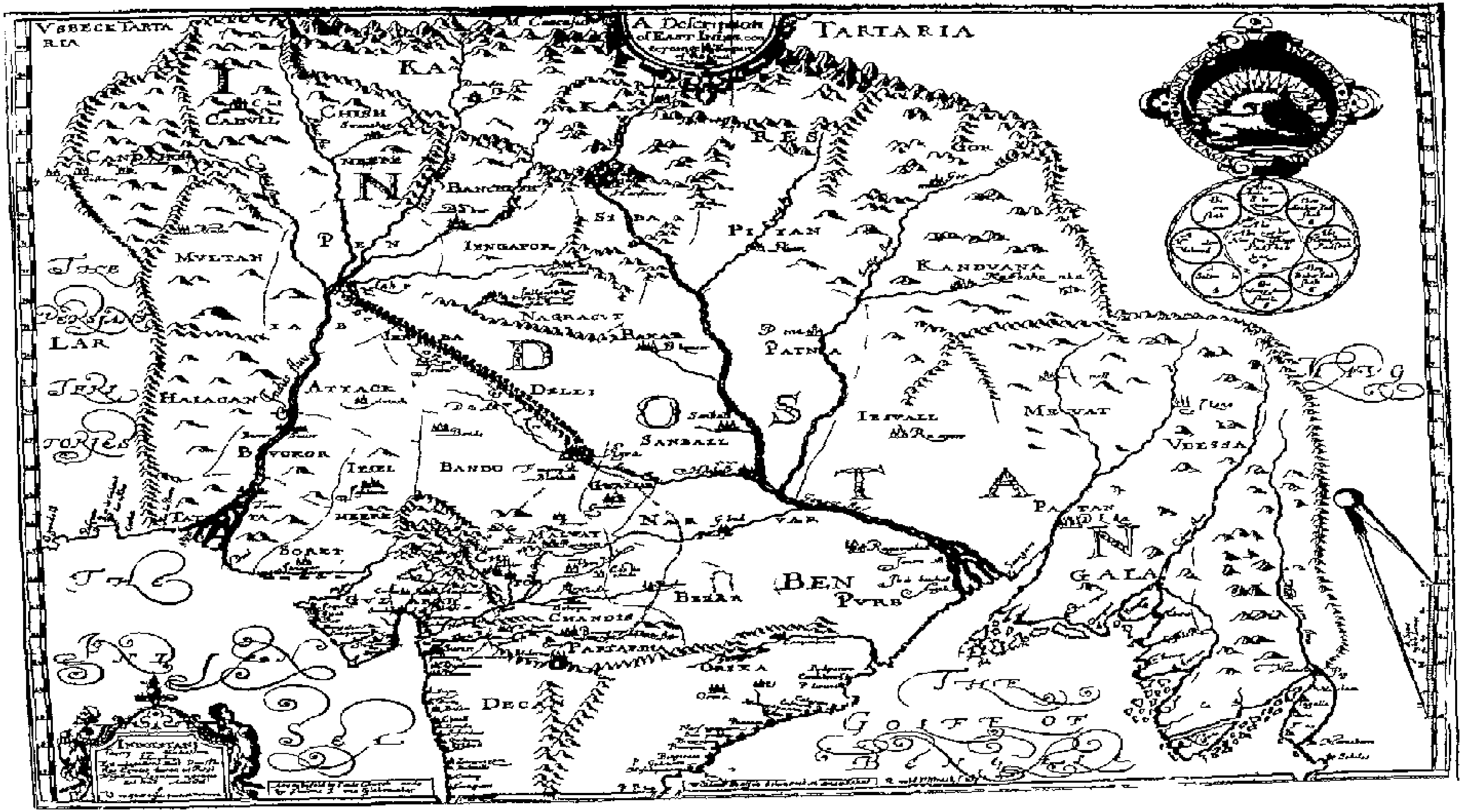
was the invention of printing which brought about the spread of knowledge, fostering an interest in adventurous men to see for themselves the places they could now read about in printed books.

2. In Search of Spices and Christians

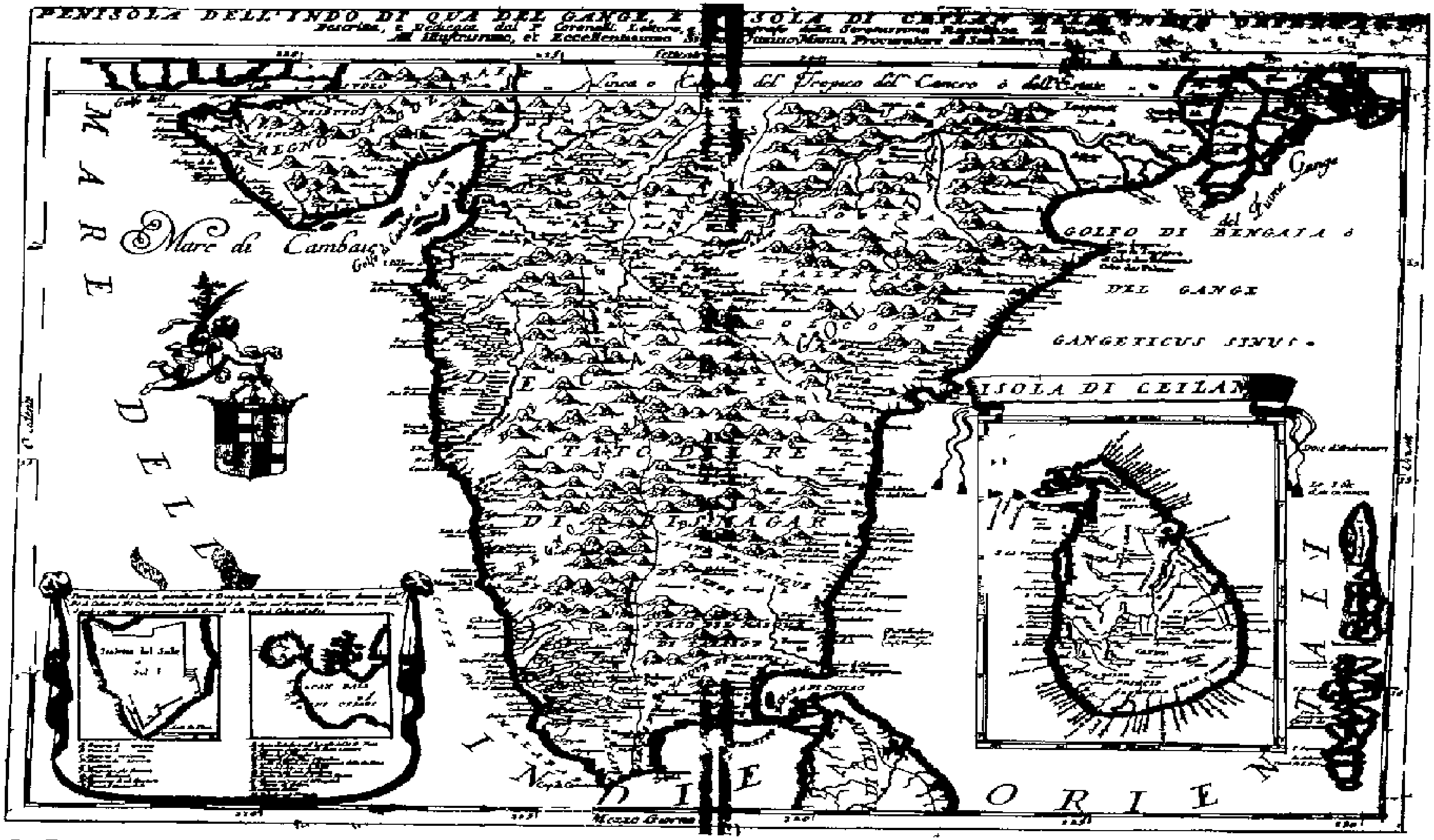
European knowledge of India was growing slowly over the centuries After the fall of Alexandria to the Muslims there was little direct contact Trade was carried on by the Arabs, as the middle east was closed to foreigners. However, with the discovery of the printing press, whatever new knowledge was gained spread over the continent more quickly. Printing had been in use for wood engravings and metal plates from the beginning of the fifteenth century but the moveable type required for books was not used until the middle of the century. The first maps to be printed were those of Ptolemy in 1477 at Bologna They were soon reprinted in Basle and Rome and later at many other places in Europe Such was Ptolemy's fame as a geographer that his tables were reprinted until 1730, although long before that date their inaccuracy was well known. The early booksellers inserted new Tables at the end of each section, giving more accurate maps to show the new knowledge gained by the wide-roving discoverers of the sixteenth century

Venice at that time was the outlet for the Arab trade with India The exotic tales they heard prompted the Polo brothers to travel eastwards and they went overland to the court of the great Khan in China On their second visit their nephew Marco went too and took employment under the Khan. He was sent on various missions, including one to south India On his return journey, having persuaded the Khan that it was easier to make the journey by sea, he escorted a Mongolian princess to her wedding in Persia An account of his travels was written in 1295, the first modern account of most of Asia. Friar Jordanus also travelled to India and wrote a description of it in his book *The Wonders of the East* in 1330 Jordanus was a French Franciscan monk, apparently sent out to India as Bishop of Columbum (Quilon) In a letter home he recommended that missionary stations could

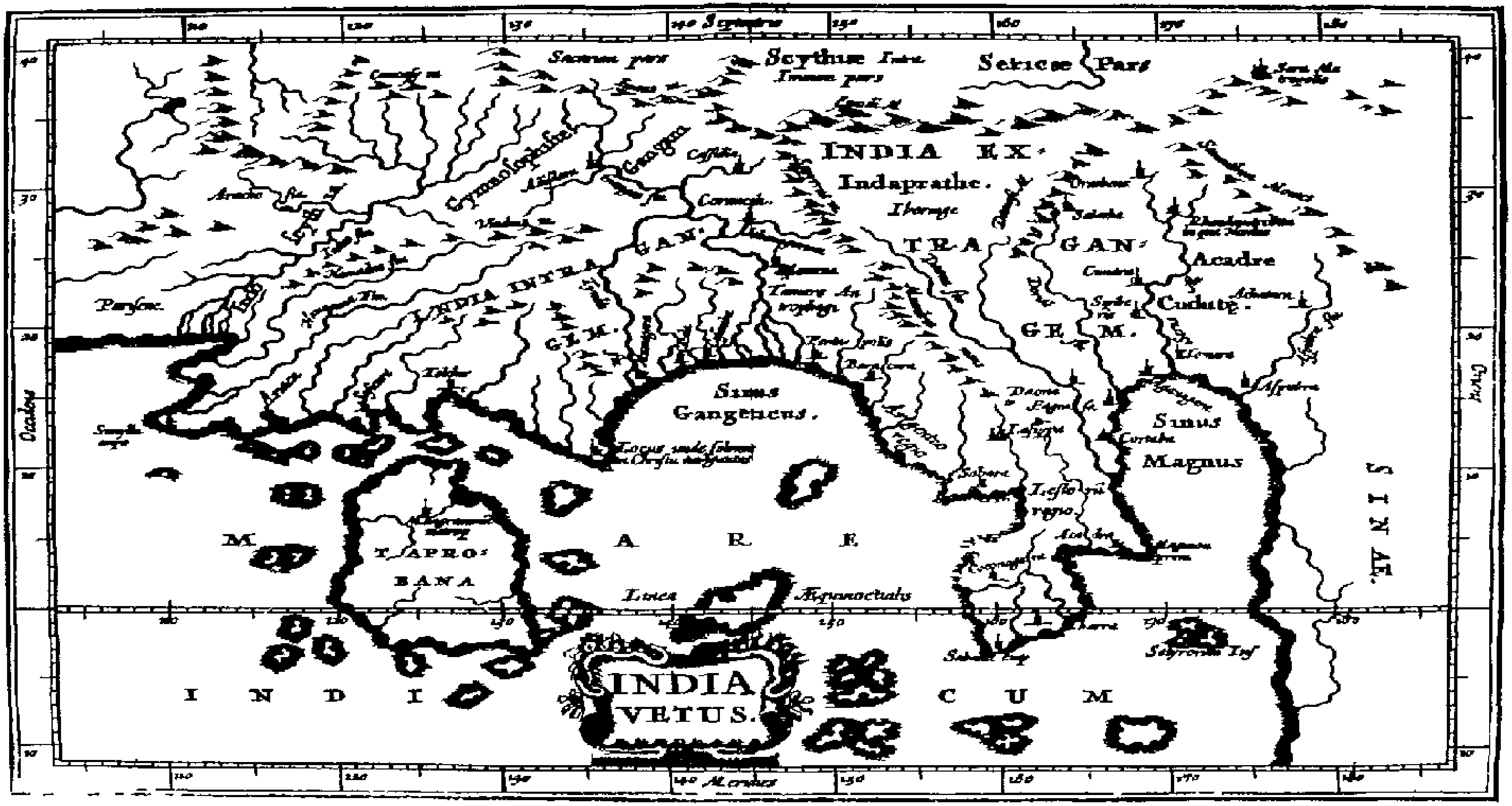
6 Linschoten's map of India and Arabia, 1596
(Reproduced by kind permission of Francis Edwards Ltd)



7 Baffin's map of the Mogol Empire 1619
(Reproduced by kind permission of the British Library)



8 De Wit's new map of the Mogol Empire, 1708
(Reproduced by kind permission of the India Office)



9 Sanson's map of Ancient India, 1710

profitably be established at Paroco (Broach) and Supera (Surat) Quilon at that time was the largest emporium on the south coast, and its territory extended on both sides of the peninsula, which accounts for Marco Polo mentioning it before Cape Comorin as he described the places on his voyage from China to Persia. Its merchants collected customs duties from all ships trading with China and Malaya. Two other Franciscan missionaries, Carpini and Rubriques, travelled overland to China, and there were letters coming regularly from John of Monte Corvino, the first bishop of Peking, from 1291 to 1328 Friar Odoric met him there in 1323 after his journey through Tibet.

The strange tales brought back by these adventurous men excited the imagination of people living in Europe. It was the beginning of a tremendous surge to discover the distant lands of the world. This impulse to look beyond their own countries was also fed by the need to trade further afield. The first prince to encourage this quest was Henry the Navigator of Portugal. The magnetic compass, releasing sailors from the need to keep close to the shore, had been improved at the beginning of the century. The Portugese, situated as they were on the edge of Europe, and cut off from the Indian trade by the Venetians, made many attempts to reach India by the sea route. Spices were a necessary ingredient in foods that had to be preserved for long periods of the winter, and the Venetians exacted heavy duties for the goods they received through the Arab traders A second reason given for their search, in a period of intense religious zeal, and pressure from the expanding Muslim empire, was to look for the Christian kingdom of the fabled Prester John. Accordingly in 1488 King John sent Bartolomeo Dias, who succeeded in rounding the Cape, but did not get as far as India. He then sent Friar Antonio de Lixbona overland, but the good friar abandoned his journey in Jerusalem when he discovered that he could go no further without a knowledge of Arabic

The following year John sent Pedro de Covilha and Alfonso de Payna overland, both of whom knew Arabic, with instructions to reach India and enquire whether there was a sea route to India around Africa. He gave them for guidance a Sea Carde taken from a map of the world by Calsadilla, Bishop of Vysen, of whom unfortunately no more is known. They reached Toro on the Red Sea, which was a centre for trade with Calicut and the Indies There they split up, Payna going to Ethiopia in search of Prester John, and Covilha taking passage in an

Arab boat to Cananor He then travelled to Calicut, and reportedly filled in his new knowledge on the Sea Carde Returning as far as Sofala on the Ethiopian coast, he entrusted the letters to King John with a Jew, Rabi Abraham, and travelled to Ormus on the Persian Gulf. He was prevented from leaving that place as the kings were constantly changing and none would give him permission to travel further. His reports, however, that there was definitely a sea route around Africa to India reached back to King Manuel, who had in the meantime succeeded John II in Portugal.

As a result of these reports a fleet of three ships under the command of Vasco da Gama successfully rounded the coast of Africa in 1497 and reached the port of Calicut. This journey is described in a book by Herman Lopes de Castanheda first published in the middle of the sixteenth century, and translated into English in 1582 by N. Litchfield, with a dedication to Sir Francis Drake In the introduction Castanheda wrote that his intention in setting the whole journey down on paper was so that the brave deeds of these men should not be forgotten and he declared them to be more worthy of note than those of any who had gone before. Faria y Souza writing nearly a century later, commented that neither Castanheda's style nor his geography were commendable but he wrote many curious, though tedious, remarks about India. Souza preferred the reports of Juan de Barros and particularly esteemed Barros for his knowledge of geography.

According to Castanheda, Vasco da Gama landed at Calicut on the coast of Malabar. He described Malabar as a province which stretched from Mount Dely to Cape Comory, and a high hill separated it from the province of Narsinga A convict, the first man to be sent ashore, was taken to the house of an Arab trader, Bontayno by name, who expressed surprise that they had come all the way from Portugal by sea. He asked why, if Portugal could send ships, France, Spain and Venice had not also done so!

After the successful return of Vasco da Gama to Portugal, a second fleet was quickly prepared and sent out under the command of Pedro Alvarez Cabral. While sailing south they were blown too far to the west and discovered the coast of Brazil On their arrival in Calicut, the Portugese were requested by the Arabs to assist them in attacking a Ceylonese ship sailing to Cambay with a cargo of elephants. The Arabs were jealous of any other trading vessels in an area they thought of as

their own, and could not foretell that the Europeans were soon to deprive them of all trade in the Indian Ocean.

The ease with which the early Portugese traders established their factories on the west coast of India convinced the authorities at home that the prize was well worth while. Accordingly a fleet of twenty ships was sent in 1502 For the next hundred years the Portugese were the only Europeans in strength in the sub-continent, and they soon had trading stations all along the west coast, and missionary stations inland. Father Monserrat, a Jesuit priest, was sent to the court of Akbar in 1579, and he accompanied the emperor on a visit to Kabul, as tutor for the young prince Murad. He drew a map to illustrate his travels but it does not appear in any European records until the nineteenth century. Certainly Rennell did not make use of it in his surveys

The discoveries of the Portugese were quickly reproduced in manuscript maps. But these charts were the closely guarded property of the King Before each voyage the captain was allowed to draw a map from the royal library, and had to return it as soon as he was safely home, marking in any new territory he had discovered However, in 1502, Alberto Cantino, an agent of Duke Ercole d'Este of Ferrara, stole a chart from Lisbon and carried it safely away to Italy It is now preserved in the Biblioteca Estence at Modena Thus the details of the Portugese discoveries leaked out to the rest of Europe.

The shape of India in the manuscript maps of the fourteenth and fifteenth centuries is a great improvement over that of Ptolemy. The first map to show Marco Polo's reports was by Abraham Cresques in 1375 It is a Catalan atlas in eight panels that was presented to King Charles of France and is now in the Bibliothèque Nationale, Paris. A Genoese map of 1457, attributed to Toscanelli, marked the new reports brought back by Nicolo de' Conti from his travels in India. Toscanelli was so well known as a mapmaker that King Alfonso of Portugal wrote to him asking for a map showing the quickest way to the Indies Toscanelli advised him to sail 'westwards'!

With the increase of printing, knowledge gained by travellers and traders spread quickly, both in books and maps. A 1508 edition of Ptolemy was the first to have the addition of a 'modern' world map by Ruysch, which was based on Contarini's map of 1506 India appears as a triangle with the peninsula coming to a sharp point. In 1515 Tome

Pires published his *Suma Oriental*, which gave very precise details of all the known places of India, with their position in relation to each other, especially for the towns on the coast. He was less sure of the places inland The Italian, Ludovico di Varthema, also spent three years in India and his history, published in 1510, was widely read.

Waldseemuller of Germany was the first to include a Tabula Moderna Indiae in his edition of Ptolemy printed in 1513 in Strassburg. A third edition in 1522, reduced in size, had additional decorations by Laurent Frisius (Plate 3) The King of Narsinga (Vijayanagar) is shown sitting on his throne in the centre of India, and north of Assam is a picture of an obedient wife committing *sati*—one of the strangest tales of Indian life to be reported by travellers.

The first separate map of India as a single country on a page by itself is by Giacomo Gastaldi in his 1548 edition of Ptolemy. This map is obviously derived from Portugese knowledge as it shows south India only, stretching as far as the mouth of the Indus (Plate 4). The west coast is drawn from fairly extensive if inaccurate knowledge, but there are very few towns shown on the east coast. Bengala is marked, but the map does not extend far enough to show the mouths of the Ganges, or perhaps the Portugese did not provide sufficient information on this area The kingdom of Narsinga (Vijayanagar) is shown north of Orissa, Delhi is on the same latitude as modern Bombay, north of the kingdom of Dacan (Deccan). The rivers run mostly north-south and blank areas are filled in with mountains, although the western *ghats* are omitted. The Maldive islands are given undue prominence—a reflection of the relief felt by sailors when they once more sighted land after the long run from the African coast.

Another map by Gastaldi was used to illustrate the travel book of Ramusio, written in Venice in 1557 That of India, along with one of Africa and one of south-east Asia, were reductions from his world map. South is at the top of the page (Plate 5) and the sea is filled with sailing vessels and fabulous sea-monsters. On land there are elephants and Scythian horsemen. A river Ganga appears, absent in the earlier map, which was to be repeated in many maps until the eighteenth century. The traveller Juan de Barros had written that two rivers, the Crusuar and the Benhar, rose behind the western ghats, united near Andanagar, and after passing through Romana, the capital of Orixa, hastened to join the Ganges with which they entered the sea The British

Museum has a map identical to this one, except for the omission of two fish near the top border, but with the name of Fer Bertoli, another well-known mapmaker of Venice Ramusio states in his introduction that he had asked Gastaldi to supply the maps Yet the two maps attributed to Gastaldi are so dissimilar it is hard to believe they were from the same hand It is frequently difficult at this distance in time, to know exactly who drew the maps Often they were the work of several men employed in the publishing house, and the master-craftsman, or owner, put his name to the finished article It also happened quite frequently that plates were stolen from the workshop So the same map may appear with a different name, sometimes with a few minor additions, often with no other change

A few years later, in 1572, the German artist and traveller, Georgius Braun, published with Hogenburg a large work called *Civitates Orbis Terrarum*—Cities of Lands of the World—in which he included drawings of the best known towns of India Calicut, Cananor, Diu and Goa These were the places where Europeans could go and live with men of their own continent This book was very popular and was reprinted many times in the following fifty years Jan Huyghen van Linschoten also published a book of travel, *Itinerario,* in 1596 Born in Holland, which was then under Spanish domination, Linschoten wanted to see something of the world and joined his two brothers who were merchants in Spain From there he went as assistant to the Archbishop of Goa and stayed in India for seven years He was thus in a position to obtain firsthand knowledge about the places he described in his book and for the map he made to accompany it (Plate 6) For the latter he relied on Vaz Dourado's map of the East Indies which had appeared shortly before Linschoten had already published a Nautical Directory in 1595, which was the standard guide for Dutch sailors for many years His *Itinerario* was very popular, German and English translations appearing in 1598, a Latin version published in 1599 at both Frankfurt and Amsterdam, and a French translation in 1610 He was the first to show that the mighty Portugese Empire was already decayed and rotten within, and that it was in no position to withstand challenges from other European nations

The India of the sixteenth century that the Portugese discovered was politically divided into three large areas In the north, Babur had marched in from Kabul and established his capital at Agra in 1526

The decadent lords of the Delhi Sultanate had scattered before him, putting up only token resistance at Panipat. The two leading Rajput rulers were those of Mewar and Marwar. Rana Sanga of Mewar had hoped to use Babur to rid India of the Sultanate, but he was himself defeated at Kanwaha and Chanderi The rich kingdom of Gujarat fell in 1566, giving the Moghuls control of the trade to the west. In the east Sher Khan Sur had declared himself ruler of Bengal, and on Babur's death he had forced Humayun to retreat to the hills of central Asia. Humayun was, however, able to fight his way back to Agra and left the empire intact for his more famous son, Akbar, in 1556 The forty-five years of Akbar's rule saw the consolidation of the Moghul empire. This was the cultural peak of Muslim India, and the splendour and learning of the Moghul court amazed all the visitors from Europe

In the peninsula the Bahmani kingdom had split up into five smaller kingdoms, Ahmednagar, Bijapur, Golconda, Bidar and Berar. The kingdom of Narsinga, mentioned by all travellers of the time and shown in their maps, was that of Vijayanagar At one time this empire stretched from the coast of Orissa to Goa, and if it could have maintained its power, the Europeans would have faced as united an empire in south India as they found in the north.

South India was composed of many small states, those on the west coast owing allegience to the Zamorin of Calicut, and the eastern part of the peninsula divided between the Cholas and the Pandyas. The name of the east coast, Choromandel, which inspired so many English cabin-boys and story-tellers, was derived from *cholomandalam*, meaning the place of the Cholas. The Cholas had been ruling since the third century B.C., but their empire was at its height between the tenth and the thirteenth centuries A.D.

European travellers in India found great difficulty in reproducing the names of the places they visited. Thus the kingdom of Vijayanagar was named by the Portugese Narsinga, after the Narasinha dynasty ruling at the time they first came into contact with it This caused some confusion and it appears variously on later maps as Bisnagar, Bisnaga, Beejanugger, Bidjanagar, Bichenegher, Bijanagher, and was also confused with the neighbouring kingdom of Bijapur As Thomas Jefferys was to write at a later date. 'We must not omit this occasion to take notice of the Confusion produced in History by such inaccurate Accounts, as well as by the corruption of the Names of Places, in which

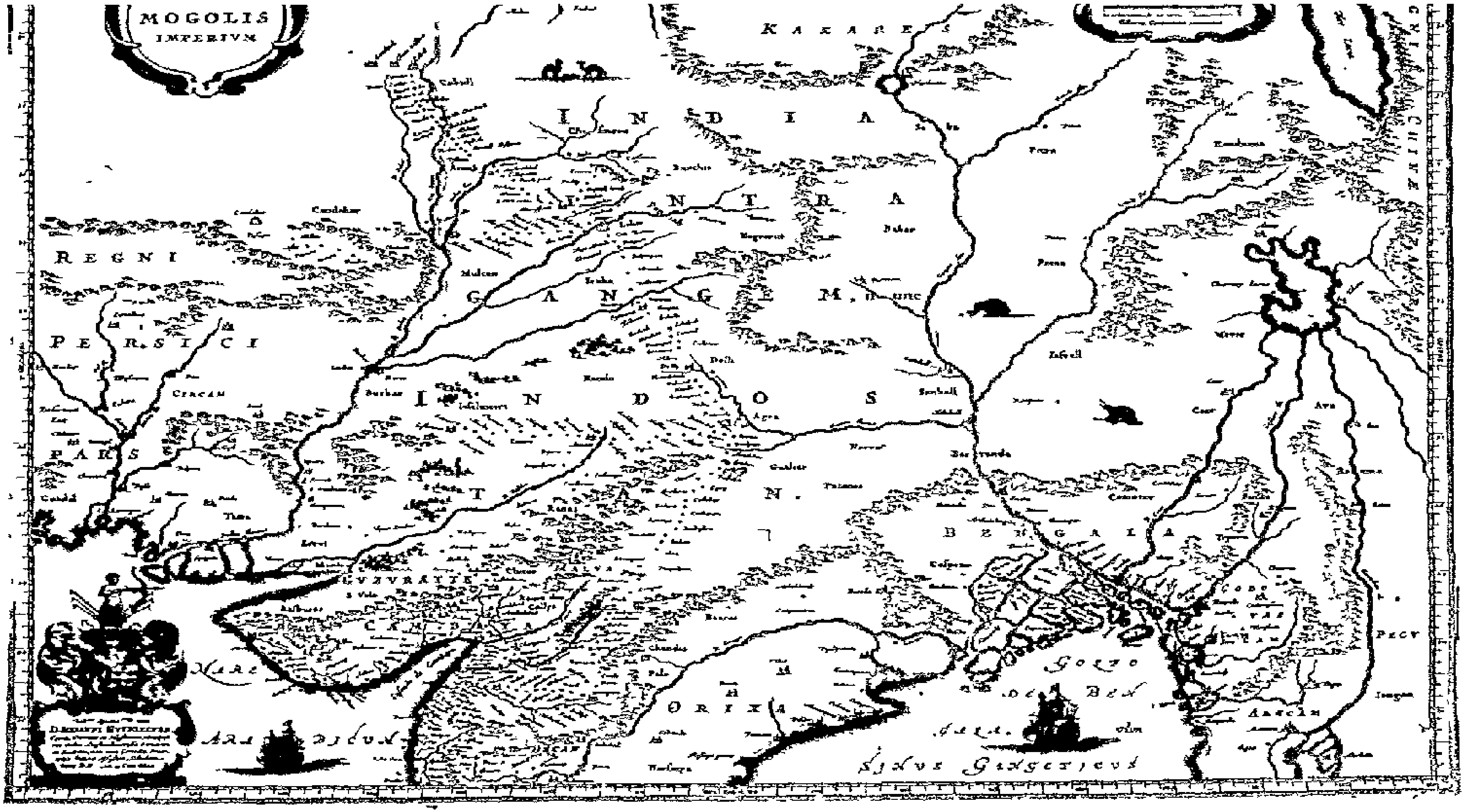
the several European nations seem to strive, who shall disfigure them most. A barbarous Contention this! and in which the French had so effectually succeeded, that one of the missioners of the year 1724 wrote word to Europe that scarce any of the Names of People or Places found in Mr Will. del Isle's map of Ceylon were known in the Indies.'

3. Magni Mogolis Imperium

During most of the sixteenth century, the Portugese were the only European nation with established stations in the east. However their strength was rapidly being sapped by rich living and the drain of young men to distant parts of the world. In 1580 Portugal was usurped by Philip of Spain. At that time Holland was also a province of Spain, and many Dutch sailors went as crew in Portugese ships. With their monopoly of the sea routes, the Portugese brought merchandise to Lisbon, and the Dutch then distributed it throughout western Europe As Portugal weakened, her place in the East Indies was taken by the Dutch who finally broke away from the yoke of Spain. English traders, seeing the profits made by the Portugese and the Dutch, attempted to grasp a share of the booty.

Popular demand was also growing among the citizens of England for the rich products of India. Two ships of the Portugese East Indian fleet were captured and one was towed into Dartmouth harbour. For the first time the people of England saw for themselves the rich plunder of silks and spices, carpets and calicos, jewels and drugs, hides and ivory. When, in addition, at the turn of the century the Dutch raised the price of pepper from three shillings to six shillings, there was a general feeling that the English should enter the trade for themselves. A group of merchants approached Queen Elizabeth for a charter to form a company and the East India Company was formed on 31 December, 1600.

The Portugese and the Dutch had gone east for two purposes only, trading and the spread of Christianity. They made little attempt to learn the manners and customs of the countries they settled in—they were only interested in profits. It was left to the English, who also started out as traders, to gain some understanding of the eastern way of life. Consequently, although it was far from their original intention it



MOGOLIS IMPERIUM
KAKARES
INDIA
INDIA INTRA GANGEM
INDOSTAN
REGNI PERSICI
CHINÆ
BENGALA
ORIXA
GUZURATTE
Mare Arabicum
Golfo de Bengala
Sinus Gangeticus
Cabul
Candahar
Multan
Agra
Dely
Gualear
Patanaw
Ava
Pegu
Aracan
Jangoma
Tatta

was the English (British after 1714) who grew rich from the profits of an empire.

As the European view of the world expanded, more and more people became interested in learning about the new and strange lands that were being discovered. To feed this interest, travel books were published, many times reprinted and translated into other European languages. The earliest collection of travel reports in England was by Richard Hakluyt. Born in 1553 Hakluyt's love of geography and discovery led him to collect and publish all the material he could find. Thus he brought out an English translation of the voyage of Cesar Fredericke, a merchant of Venice who visited India in 1567, and a letter from Thomas Stevens to his father dated 1579. Stevens, a Catholic, had joined the Jesuits in Rome and requested to be sent on missionary work in India. He was to be of great help to four Englishmen taken to Goa as prisoners in 1583. Only one of the four, Ralph Fitch, finally returned to England and the account of his travels was published by Samuel Purchas, the successor to Richard Hakluyt. A letter to Hakluyt from John Newberry, one of Fitch's companions, dated 1583 from Aleppo, shows the interest and pains that were taken to make these accounts as complete as possible. 'Since my coming to Tripoli, I have made very earnest inquiry both here and there, for the book of Cosmography of Abulfeda Ismail, but by no means can hear of it. Some say that possibly it may be had in Persia, but notwithstanding I will not fail to make enquiry for it, both in Babylon and Balsara, and if I can find it in any of these places, I will send it to you from thence'

Fitch and Newberry escaped from Goa, and decided to travel to the court of the Great Mogul to request his assistance in reaching home They travelled through Belgaum and Bijapur to Golconda, where they were very interested to see the diamonds that were mined there. Then, passing through Bidar, Mandu and Ujjain, they reached Agra and learnt that the Emperor was at Fatehpur Sikri. They had an audience with him there and then separated, Newberry planning to return to England overland and promising to meet Fitch in Bengal in two years' time with an English ship Unfortunately no more is heard of him, so it is likely that he died on the journey. Fitch travelled down the Jumna by boat, recording the places he passed, Prayag, Bannaras, Patenaw and Tanda. Then he left the Ganges for a short visit to Couch Behar and mentioned the trade caravans he saw there from Tibet and

Bhutan He stayed for some time at the Portugese settlement of Hugeli and recorded that it was at twenty-three degrees in the northerly latitude, which is almost correct. From there he visited Pegu (Burma) and finally returned to England, after being away for eight years In the meantime he had been presumed dead, and there is a record that his will, made in 1582 before he set out, was proved and his property divided among his heirs. His reappearance must have been as amazing as the tales he had to tell.

The first official expedition of the East India Company to reach India arrived at Surat in 1608, led by William Hawkins They met with great opposition from the Portugese and the Dutch who were by then well known to the Moghuls and who feared competition from a third European nation So, in 1615, the Company decided to ask King James I to send an ambassador to the Emperor Jehangir, with the intention of gaining firm decrees allowing the English to set up factories, as the trading stations were called, in India Sir Thomas Roe was chosen, and he spent four years at the court. Roe saw himself only the land between Surat, where he landed, and Agra and Ajmer, where Jehangir had his court, and some of the country further south when he accompanied the Emperor on one of his war marches. However the map issued under his name (Plate 7) was the standard map of north India for nearly a hundred years It was drawn by William Baffin, the first mate on the ship *Anne* by which Roe returned to England. Baffin later became famous for his surveys of the Canadian coast, and the fact that he was the first modern cartographer of India is less well known

This map shows evidence of combining all the travellers' tales that had so far been published or gained by hearsay. In 1612 Robert Coverte published his *Voyages and Travels, a True and Almost Incredible Journey.* He had been taken to Surat as a castway, met William Hawkins in Agra, and then travelled by the southern route to Ormuz to take ship back to England. He had avoided the northern route through Lahore as John Mildenhall in 1605 had reported that it was very dangerous. Another solitary traveller was Thomas Coryat, who went on foot all over Europe and, via Jerusalem, found his way to the court of the Great Mogul. There he met Roe, and must have given him an account of the places further north that he had passed through. His book, *Coryat's Crudities* published in 1616, did not include a description of India, but he wrote many letters to England describing the marvels

he had seen and the places he had visited. So, in drawing his map, Baffin did not rely solely on what Roe had to tell him, or what could be gathered from the geographical description published along with Roe's Journal by Samuel Purchas six years later. In France too, Jean Mocquet had published an account of his visit to Goa as apothecary to the Conde de Feira in 1617, and an English translation of the Comte de Montfart's travels overland to Goa was published in London in 1615. Francois Peyrard also published a lively account of his imprisonment by the Portugese in Goa. He had been shipwrecked while on a voyage to the East Indies, and had been taken first to the Maldives where he stayed for several years

In his geographical description Roe named each province of the Mogul's Empire and its chief town, starting, as he says, at the north-west. This led to considerable confusion in their placing on a pictorial map Also, although he claimed that he obtained the list from the royal records, he was not able to distinguish between the important and the small provinces. It is more likely that he copied a chronicle of the Moghul conquests. He was able, however, to place the mouth of the Indus in the correct position, and point out that it was incorrectly shown in Mercator's atlas. Roe had presented a copy of this atlas to Jehangir, but it was returned after four days as no one in the Moghul court could make any sense of it, thereby implying that they were not in the habit of seeing their land in a pictorial representation. Yet Marco Polo makes three references to charts and documents of experienced Arab mariners who frequented the Indian Sea. Vasco da Gama also reported that a Moor he met at Melindi on the African coast showed him a chart on which the whole stretch of the Indian coast was mapped, with meridians and parallels but without rhumb lines.

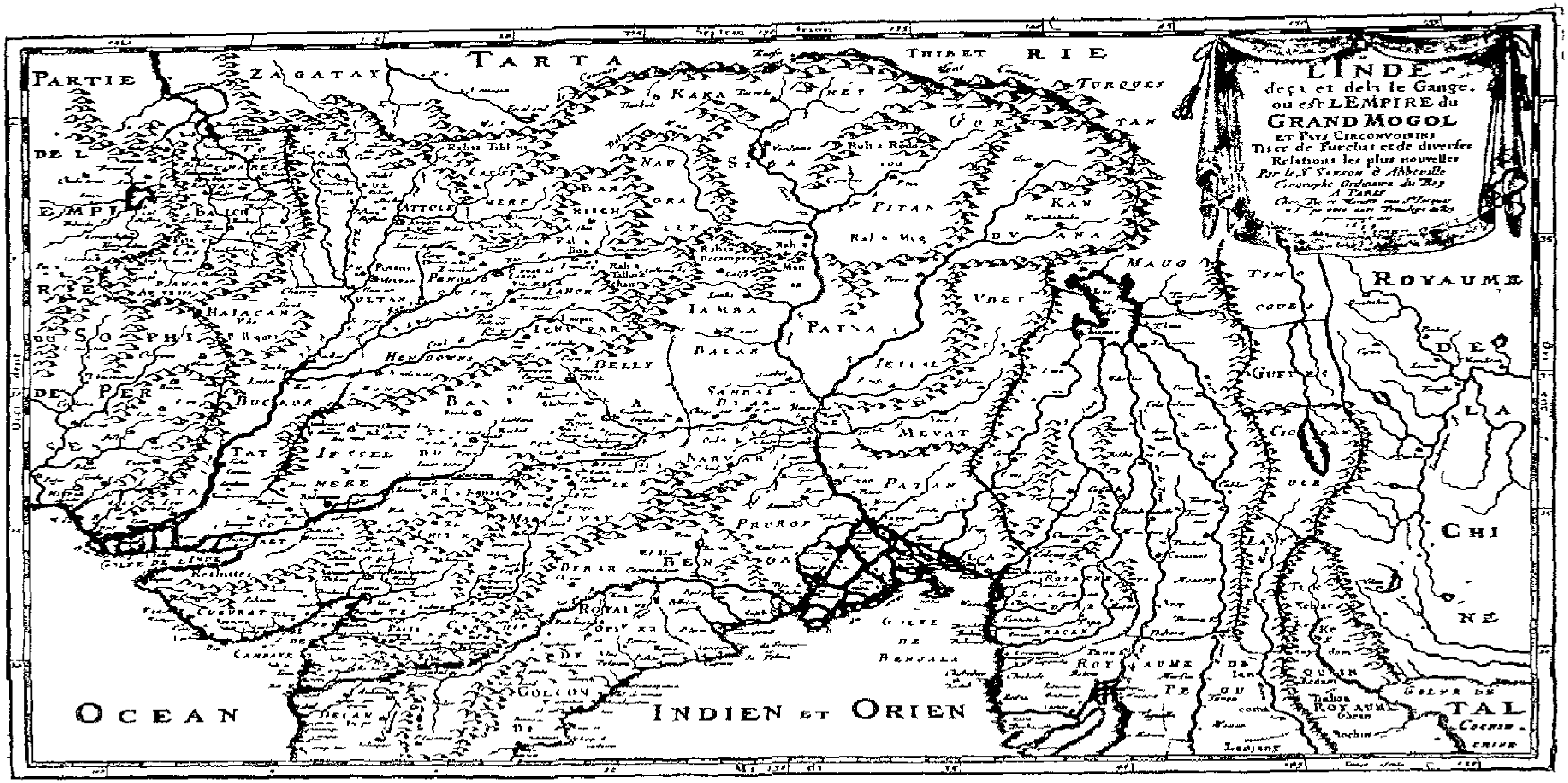
The kingdom of Orissa appears twice in Baffin's map. It was already known correctly from Portugese reports, but Roe had stated that the province of Odessa with its principal town of Jagernat lay at the utmost east of the Mogul's territories, beyond the Bay of Bengal. So Baffin placed it between Bengal and Burma, keeping also the province of Orixa, obviously not recognizing them to be the same place. Patna is also incorrectly placed on a tributary of the Ganges, although Fitch had stated that he had passed through it while sailing down the Ganges. Roe had no knowledge of the Himalayas, although

he shows the Ganges issuing forth at Hardwar through the mouth of a cow. This cow's head was distorted by later copyists into a small lake. The large lake between India and China which had been reported by Marco Polo and Mendes Pinto is also absent although it reappears in most European maps published shortly after, which were directly copied from Baffin's map. Mendes Pinto was a Portugese sailor who had been shipwrecked off the coast of China in 1537. He and the only other survivor wandered around in China for twenty years, begging for food and frequently jailed for vagrancy. They were allowed to appeal in Peking against the sentence that their fingers should be cut off, and while there were rescued by a marauding band of Tartars. With their intimate, inside knowledge of Chinese fortresses they were able to assist their new friends in storming several citadels and were rewarded by being escorted to Indo-China where they found a boat to take them back to Goa.

Mendes Pinto's description of his adventures was published in 1614, with a Spanish translation appearing in 1620 and a shortened version by Purchas in 1625. The full English version appeared in 1653. In his book he described Lake Singapamor from which four rivers flowed, one running east, a second south-east, the third south, and the fourth he thought was possibly the Ganges, flowing to the sea through Bengala! Ortelius had shown this lake on his map of Asia in 1580, calling it Chyamai, but Roe obviously did not hear of it while he was at the Mogul court, and so Baffin did not include it in the map he drew on Roe's instructions. Yet within ten years this lake was again in all the maps appearing in Europe, which were direct copies of Baffin's map.

Separate maps of India do not appear in the famous atlases of Ortelius and Gerard Mercator. Their India Orientalis included the whole of Asia, sometimes as far as Outer Mongolia, which they called India Extrema. South-East Asia was usually called the second India, or India beyond the Ganges. The atlases of Hondius, Blaeu, and Jansson, the famous Dutch cartographers of the seventeenth century, and those of Sanson d'Abbeville in France, all included the Empire of the Great Mogul, based on Baffin's map (Plates 10 and 11). But their maps of India are not nearly as colourful or picturesque as those of Africa, America and the Far East.

Cartography as a pictorial decorative art was at its peak in Holland in the late sixteenth and early seventeenth centuries. Many of


L'INDE
deçà et delà le Gange,
ou est L'EMPIRE du
GRAND MOGOL
ET PAYS CIRCONVOISINS
TARTARIE
PARTIE
ZAGATAY
THIBET
ROYAUME
CHI NE
OCEAN
INDIEN ET ORIEN
GOLFE DE BENGALA
TAL

the maps appearing either as separate sheets or bound up as atlases were beautifully designed and engraved, and provided much topical information on style of dress, strange customs of the inhabitants, or the new types of animals and trees to be seen. Thus Blaeu's map of Africa has vignettes of the principal towns across the top and on either side are small pictures of native people in pairs. The sea is dotted with ships and various animals fill in the blank parts of the maps where geographical knowledge was lacking. Many African maps of the period were similarly decorated. Yet Blaeu, Hondius, and Jansson included in their atlases only one map of India, that of the Mogul Empire copied from Baffin, with decoration limited to a cartouche and a few small animals. India apparently did not arouse the imagination of the cartographers, or possibly they hesitated to populate their maps with strange figures when travellers were reporting a civilization as rich or richer than any in Europe.

4. The Way to the Indies

Throughout the seventeenth century the interest of the Europeans for India lay solely in the profits that could be made from trading. There was, however, increasing interest among individual travellers, and as their reports were made public at home more people wanted to hear about the strange countries that were being discovered This interest is evident in the number of travel books that were published In 1626 Samuel Purchas included the map and journal of Sir Thomas Roe in *Purchas his Pilgrimes,* as well as the diary of William Methold who visited the diamond mines of Golconda, and that of Edward Terry who was for some time with Roe as his priest. The travels of Mandeslo were published in 1644, and the letters of Pietro della Valle in 1652. Jean-Baptiste Tavernier, who lived for many years at Aurangzeb's court and helped in the manufacture of the Peacock Throne, wrote an account of his travels in 1677, which appeared soon after that of Francois Bernier, for some time physician to Aurangzeb. However, all these books did not add enough new knowledge to change the maps. As long as their public was satisfied, it was cheaper for the publishers to print more maps from the same blocks, instead of going to the expense of making new blocks. Hence the same mistakes were repeated again and again unless there was very definite evidence that the maps were incorrect.

In the middle of the century Sanson, in France, published two maps of India, one of the Mogul Empire and another of the peninsula, which reflected little new knowledge of the country (Plate 12) They were copied and translated into English by Richard Blome for his *Geographical Description of the World,* published in 1670. Two years later Phillipus Baldeaus in Holland published a large book dealing exclusively with south India, *Naauwkeurige Beschryvinge van Malabar en Choromandel,* in which he included views of the major Portugese settlements

on the coasts and two new maps. He had lived for many years in Goa as a missionary In Italy Vincenzo Maria Coronelli published two very decorative maps of the subcontinent, which are more pleasing to the artist's eye than the geographer's (Plate 8).

A prodigious mapmaker and publisher of Holland, Pierre van der Aa did much to rouse the interest of armchair travellers, without contributing new knowledge for the geographers. He published a vast number of maps, changing the shape and scale as required to fit into his decorative borders (Plates 13 and 14). He provided illustrations for every famous traveller's tale, marking the supposed route and adding fanciful decorations. He even re-engraved Baffin's map more than a hundred years after it had first appeared, when its inaccuracy had been known for a long time (Plate 15).

Some publishers announced that they were printing revised and new maps, in accordance with the knowledge that had been brought back to Europe. In France Frederick de Wit made a revised version of Blaeu's Magni Mogolis Imperium in 1708 (Plate 16), which was reprinted several times in different atlases. However there is nothing new about it. It was very difficult for the mapmakers in Europe to amend their maps, when so few travellers were able to give exact and correct locations of the places they passed through In addition there was no standard length of measurement for the journeys In India the measure used for distance was the *cos,* but the *cos* varied in different parts of the country. Alternatively they reported 'so many days' journey', which hardly gave an exact measurement or direction to be pictured in a map of any scientific value Even in Europe there was no standard length of measurement and cartographers often marked the scale according to the miles of the different countries

In one field of cartography, however, progress was being made. As the frequency of voyages into and across the Indian Ocean increased, a better knowledge of the coasts was required by the ships' captains. Accordingly in the 1703 edition of *The English Pilot,* John and Samuel Thornton included, in Book III Oriental Navigation, new charts of the Indian coast. Later editions were continually augmented by further charts as they were drawn or obtained by the hydrographers.

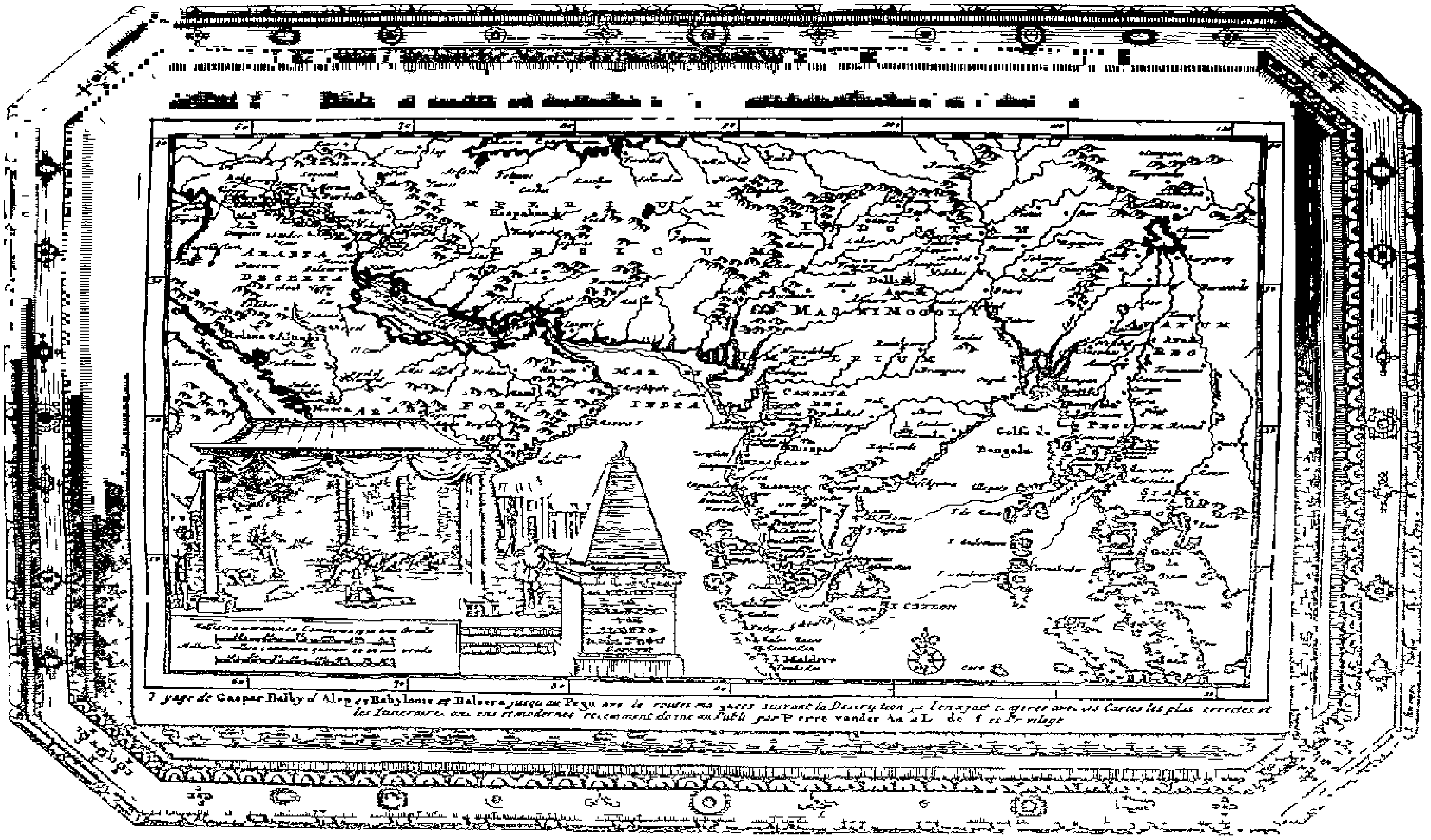
It was still a perilous journey, fraught with dangers both from natural hazards and from fear of pirates. The science of navigation was not yet well developed and captains had to rely more on sailors' tales

than correct manuals or charts However as the number of voyages increased so did the knowledge Purchas, in 1625, had published the detailed notes of John Davis of Limehouse, made during his fifth voyage to the Indies. But few sailors were also writers and literary men did not have the scientific and technical knowledge to comprehend the directions of seamen.

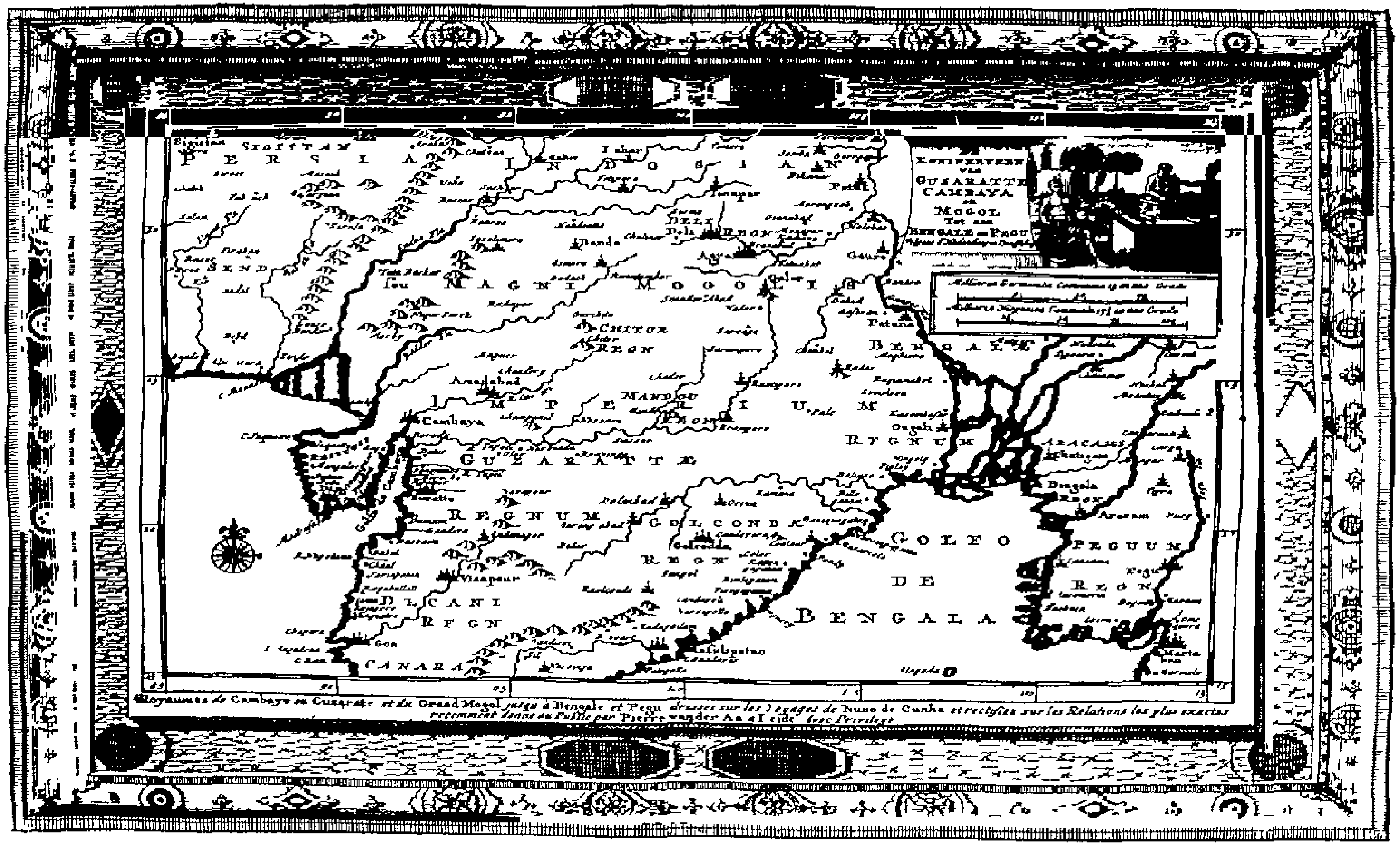
Most sea charts of the time were made by Dutch surveyors, and many of the early ocean-going ships carried Dutch pilots. But around the Indian coast, it was soon the English who were the paramount power. Bombay had been transferred to them with the dowry of Catherine of Braganza on her marriage to Charles II in 1661. The East India Company acquired it in 1668 for an annual payment of £ 10. The Company, realising the importance of up-to-date knowledge of the coasts and harbours, repeatedly made requests that copies of all charts and surveys should be sent to them in London. Thus in 1685 John Thornton, who held the appointment of Hydrographer to the Honourable East India Company, was able to publish a New Mapp of the Island of Bombay and Salsett. There were several maps showing the coasts of the Bay of Bengal, notably those of Jansson in 1658 (Plate 17), Doncker in 1665, Valentyn in 1726 and Halley in 1728. Many coastal charts also gave small inset views of the land, as seen from the sea, making it easier for sailors to recognise where they were (Plate 18).

France by this time had become a major centre for mapmaking. Apart from the new rather severe style of d'Anville, there was increasing interest in sea charts In his *Petit Atlas Maritime*, first published in 1740, Jacques Nicholas Bellin gave many new maps of the coasts of India. Bellin was attached to the French Marine Office and was in a position to receive new charts brought back by ships' captains His clean, clearcut style and distinct lettering were as great an advance as his insistence on geographical accuracy. His atlas was followed in 1745 by the *Neptune Oriental* of d'Apres de Mannevillette. D' Apres was himself a widely travelled man and had shown an early interest in accurate charts of the East Indies His *Neptune Oriental* was published with the approval and support of L'Academie des Sciences, and hailed by navigators throughout the world

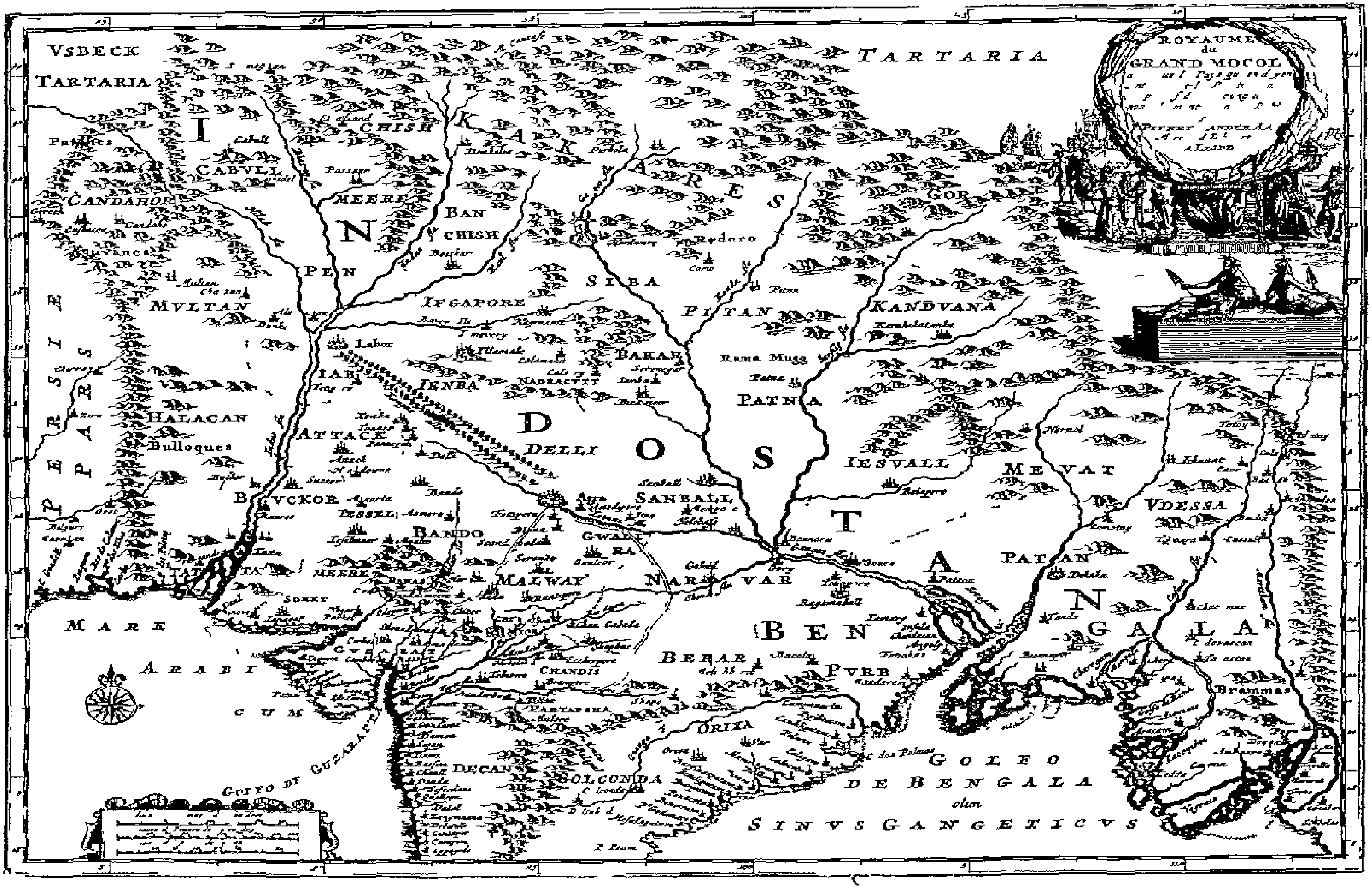
Early charts were often marked with the directions of the trade winds at different seasons of the year. Before the age of steam engines the winds were of primary importance in navigation as the Egyptians



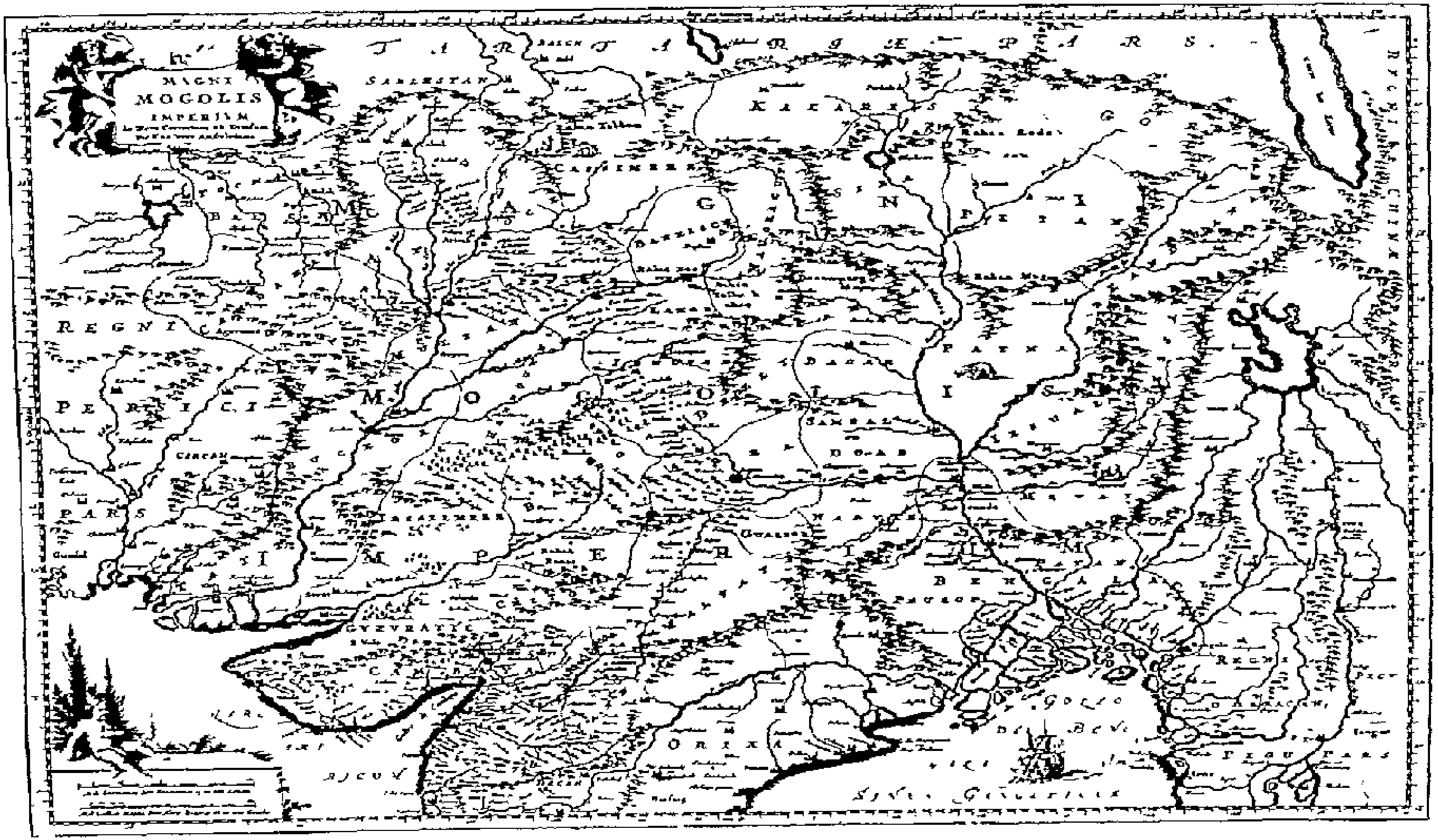
13 Aa's map of India and Arabia, 1714



14 Aa's map of Gujarat and the Mogol Empire, 1714



ROYAUME du GRAND MOGOL
TARTARIA
VSBECK TARTARIA
INDOSTAN
PERSIA
CANDAHOR
CABVLI
MVLTAN
HALACAN
Bulloques
ATTACK
DELLI
SANBALL
BAKAR
PATNA
KANDVANA
IESVALL
MEVAT
VDESSA
PATAN
BENGALA
BERAR
PVRB
ORIXA
GOLCONDA
DECAN
MALWAY
BANDO
GVZARAT
MARE ARABICUM
GOLFO DE BENGALA olim SINVS GANGETICVS
GOLFO DE GUZARATE



16. De Wit's new map of the Mogol Empire, 1708
(Reproduced by kind permission of the India Office)

had discovered. Although it was possible to sail in any direction it was a great advantage to know that at certain times certain winds could always be relied upon. This was particularly so in the Indian Ocean with its strong monsoon currents. Hence they were shown on the charts with lines of arrows marking the direction of the winds in particular months.

The land maps of India did not show any improvement for a long time. The different kingdoms were then in a constant state of change, but this was rarely reflected in the maps made from the stories of European travellers Once a name and a rough location had been established, it was repeated long after the kingdom had disappeared. Thus the kingdom of Narsinga had been reported by the Portugese in the sixteenth century, when the kings of Vijayanagar were powerful throughout south India. The town was sacked in 1565, yet Narsinga appears in maps, called mendaciously 'new maps', as late as 1720 Similarly the town of Golconda, founded in 1518, was abandoned in 1589 as it was considered unhealthy. A new capital was built at Bhagnagar and the province was annexed by Aurangzeb in 1687 It formed the centre of the Moghul province of the Deccan until, in 1722, Asaf Jah broke away from the decaying Moghul empire and founded the dynasty of the Nizam, calling his capital Hyderabad. The kingdom and town of Golconda were still appearing in maps of India as late as 1780, although the name Bhagnagar is in Catrou's map of 1709.

The rise of the Maratha empire also did not appear on the maps until long after the establishment of their sovereignty By 1737 the Marathas under Baji Rao were at the gates of Delhi In 1740 the plates for an expensive new atlas, the *Novus Atlas* of Mathius Seutter, were engraved in Germany. The map of India is that of the early seventeenth century, maintaining the worst mistakes of Roe, Hondius and Blaeu, and with more recently acquired names placed wherever there was room to fit them, but ignoring the changing political scene. Herman Moll in England drew several maps both for books of geography and for atlases, which were copied from the earlier maps of Baffin and Blaeu (Plate 19). Fraser used one of them in his *History of Nadir Shah* in 1742, and added the words, 'This map has been copied from one of the most correct of this kind extant, and is pretty exact, excepting a few of the distances. The names of several places, which hitherto were much corrupted, are here properly expressed.' Fraser had

lived for ten years in India, and was thus one of the few Europeans to give a recent account of events there. He also made an amazing collection of Persian and Sanskrit manuscripts, which he listed in the back of his *History*. Yet his map still shows Udesse east of the Ganges. Chatelain, too, in 1719, produced a map of south India which showed no new knowledge (Plate 20) It was copied the following year by Van Keulen and there is very little difference between the two. However that year was a turning point in the maps of south India, with the publication of a map sent to France by a Jesuit priest, Father Bouchet.

5. European Rivalry

The Europeans were able to map the south of India with greater accuracy earlier than the north. In 1719 Father Bouchet sent home a small map of south India which for the first time showed up-to-date knowledge of that part of the country As Thomas Jefferys observed, the only people who were in a position to record the geography correctly were the missionaries, and they were inclined to keep their knowledge to themselves However, Bouchet not only sent home a small map (Plate 23) but when d'Anville, the official cartographer for the French East India Company, complained that it was on too small a scale, Bouchet followed it up with more manuscript charts This enabled d'Anville to make his map of India, in 1737, far more accurate than any that had been published before Another Jesuit, Boudier, sent home exact positions of Delhi, Agra, and Madras, which helped in correcting other places in India Boudier visited the observatory of Jai Singh at Udaipur and was an accomplished astronomer.

Jean-Baptiste Bourgignon d'Anville may be called the first scientific mapmaker. His maps look rather austere and bare after the decorative maps of the previous century because he believed in geographical accuracy rather than eye-catching embellishment He drew upon all the source books he could obtain, using Ptolemy's lists, a Turkish geography he called Kiatib-shalebi, an Indian geography in Tamil he called Puwana-saccarum, as well as the books of later travellers. He was not a traveller himself, but from his Paris home he maintained a wide correspondence and received all new charts that were sent back to France.

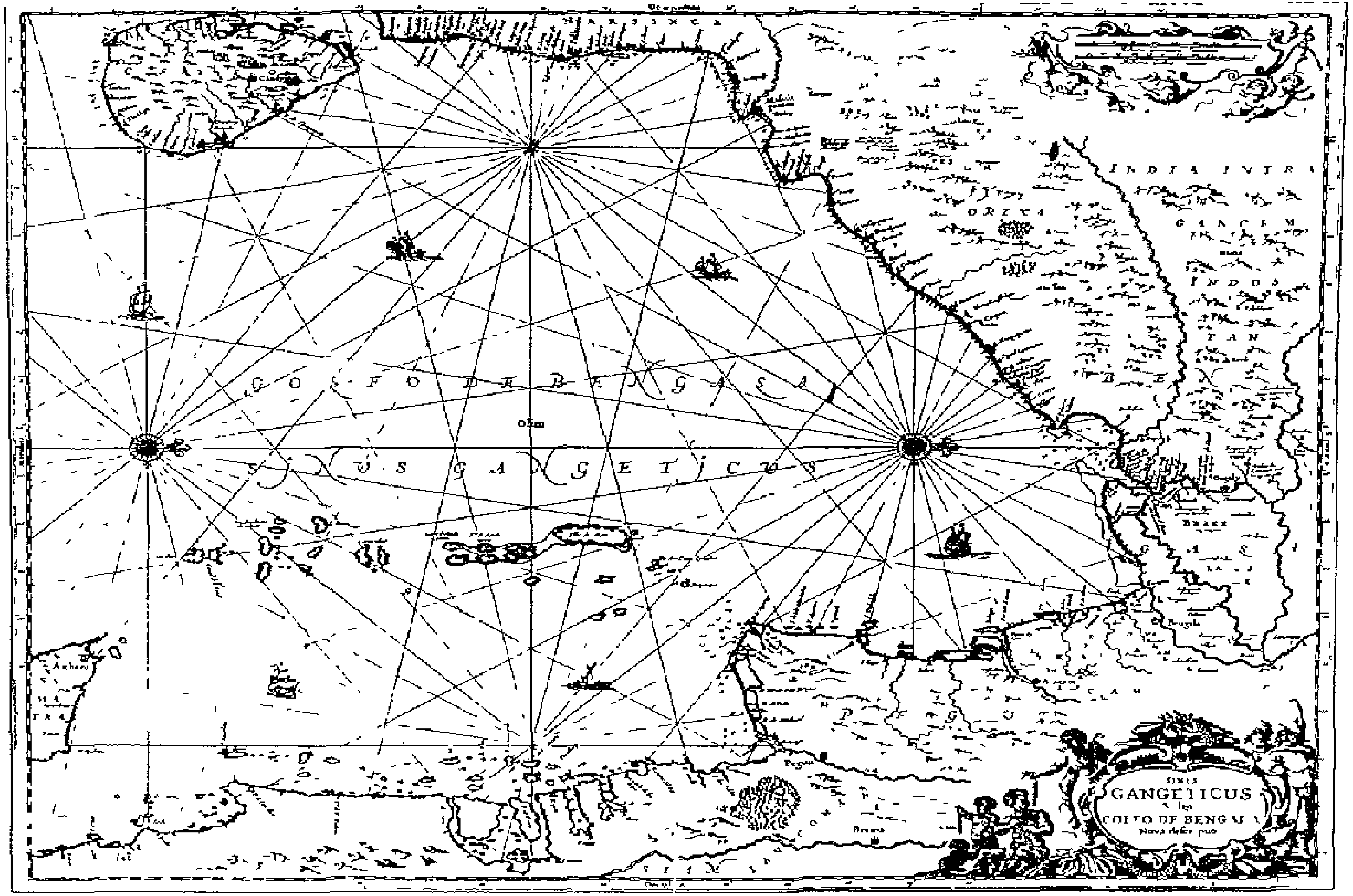
Although d'Anville perpetuated many of the mistakes of the earlier cartographers, he did attempt to verify all his material. Thus, he records, that having heard of Satara, the Maratha capital, he wanted to locate it correctly on his map. At that time the Portugese

were fighting the Marathas so he asked M le Cerda, ambassador from Portugal to the French court, for the exact location Le Cerda told him that it was in the *ghats,* eight days journey from Goa and nearly the same from Bombay, at the apex of a triangle formed by these two lines and the coast D'Anville, however, wrote in his *Eclaircissement,* 'This computation is not exact enough for me to insert Satara in the map'

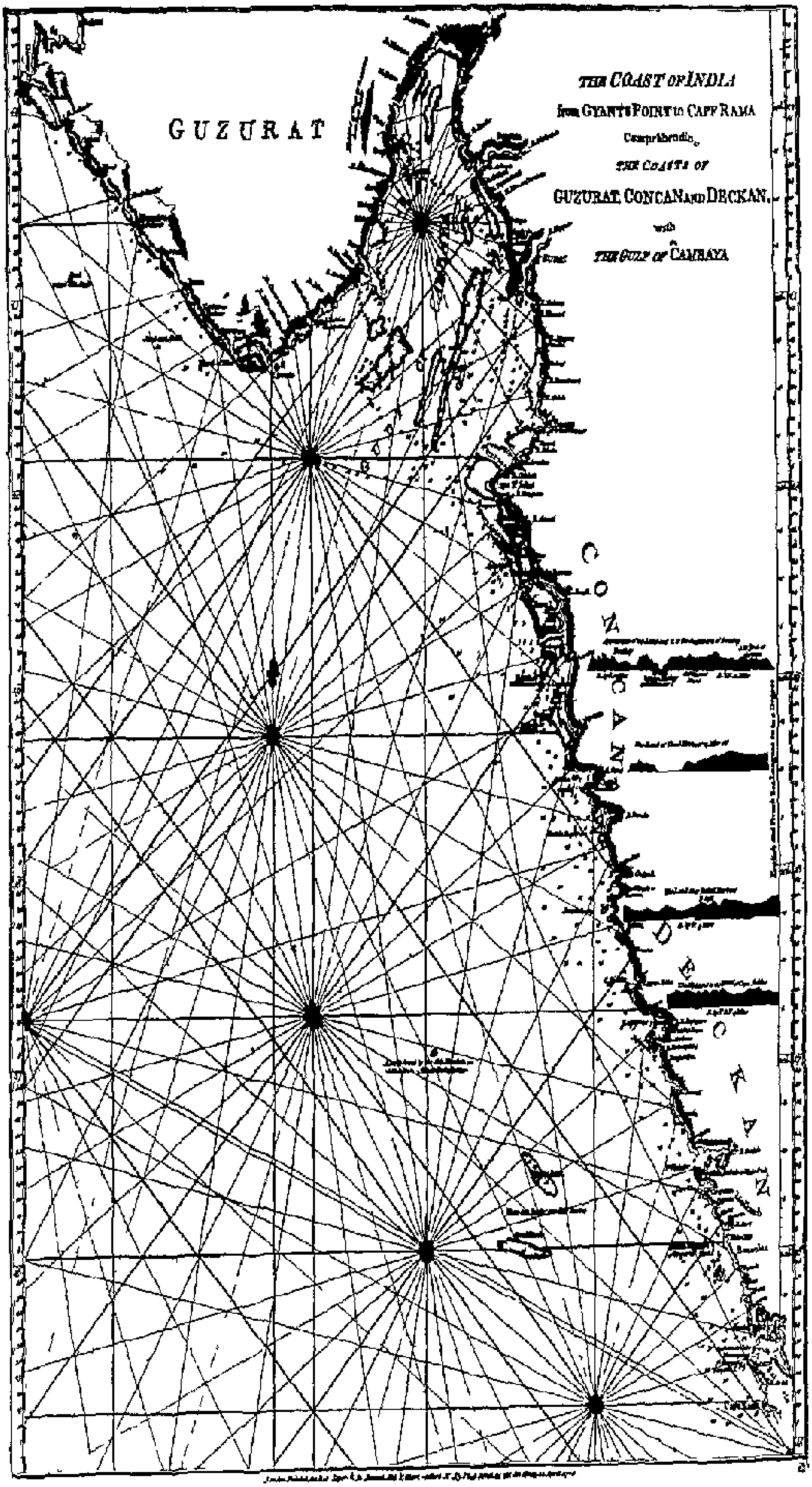
Guillaume de l'Isle had already drawn a new map of south India in 1723 (Plate 21), also based on Bouchet's map This was copied ten years later by the German publishing family of Homann (Plate 22) D'Anville differed from de l'Isle on many points, and particularly on the mythical river Ganga De l'Isle had omitted it and J-N Bellin in 1740 wrote alongside it that its course was not known (Plate 24), but d'Anville preferred to believe the traveller Barros and retain it in his map It was Robert Orme who first stated that it did not exist Although Bellin's coastal maps were an advance on earlier ones his land maps showed little new knowledge (Plates 25 and 26) Instead of the Ganga, he drew another large river, the Andi, in its place, not flowing into the sea but joining the Son at Rotas He followed Baffin with a second Orissa, placing it north of Monghyr with its capital of Jokanat, and retained Siba and Nakrakut as large provinces However, he did include some of the towns, such as Poona, reported by more recent travellers

By the middle of the eighteenth century only two European powers were striving to gain supremacy in India The Portugese still had their stations at Goa, Daman, and Diu, the Danes were at Tranquebar and the Dutch had a few small factories but none of them were of any importance It was the French and the English, as a reflection of their hostility in Europe, who were vying with each other to command the trade from India Apart from a few skirmishes around Hoogley and Chandernagore, their confrontation was in south India

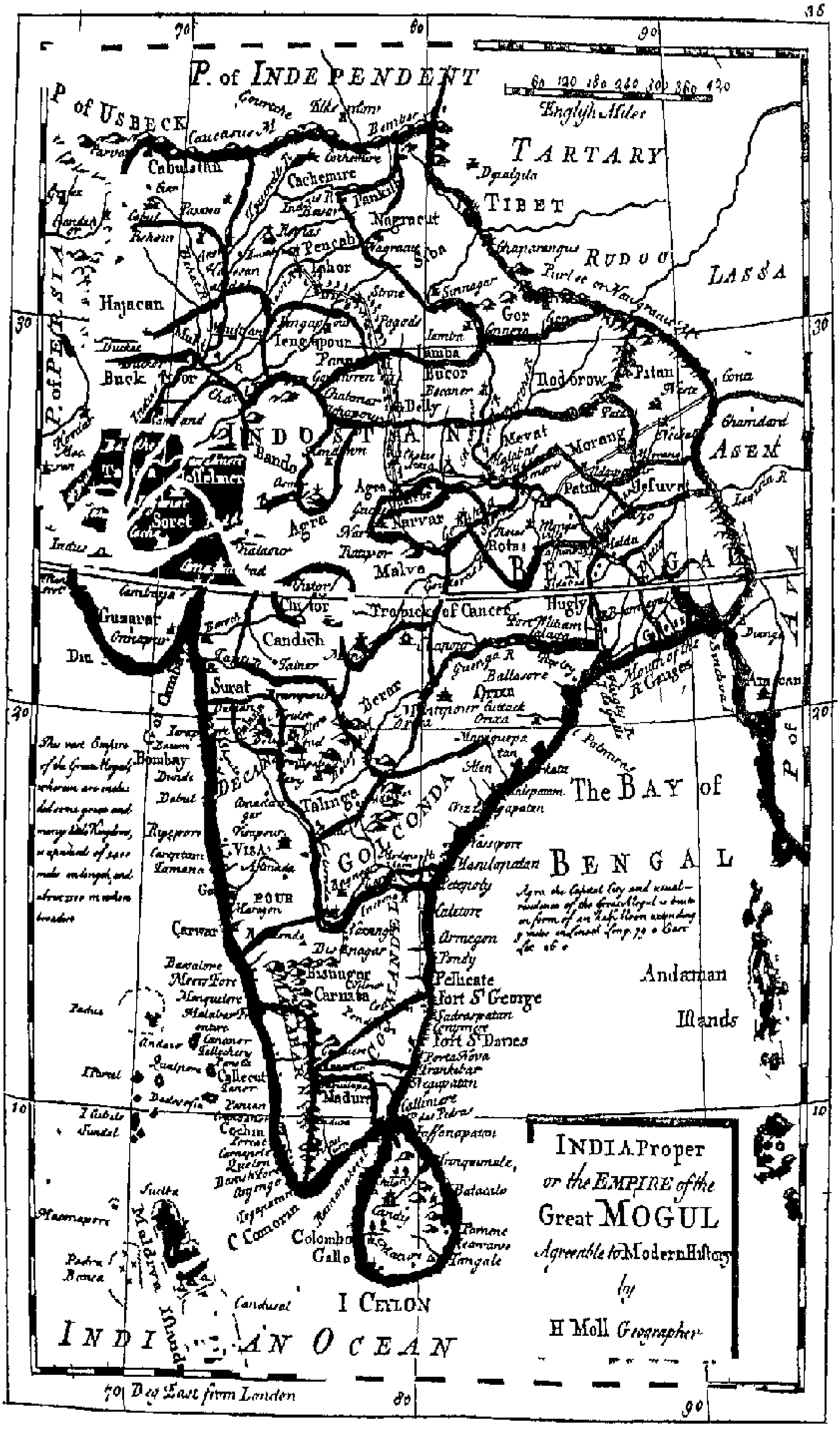
Until this time few traders had ventured inland Their business was on the coast, purchasing merchandise brought to them there and despatching it in their own ships Occasionally a trip would be made to the centre of the province for the granting of new trading rights, or the renewal of existing *firmans* R O Cambridge makes this point in the Introduction to his *Account of the War in India between the English and the French* 'It is sufficient to say that the work before us is not a history of



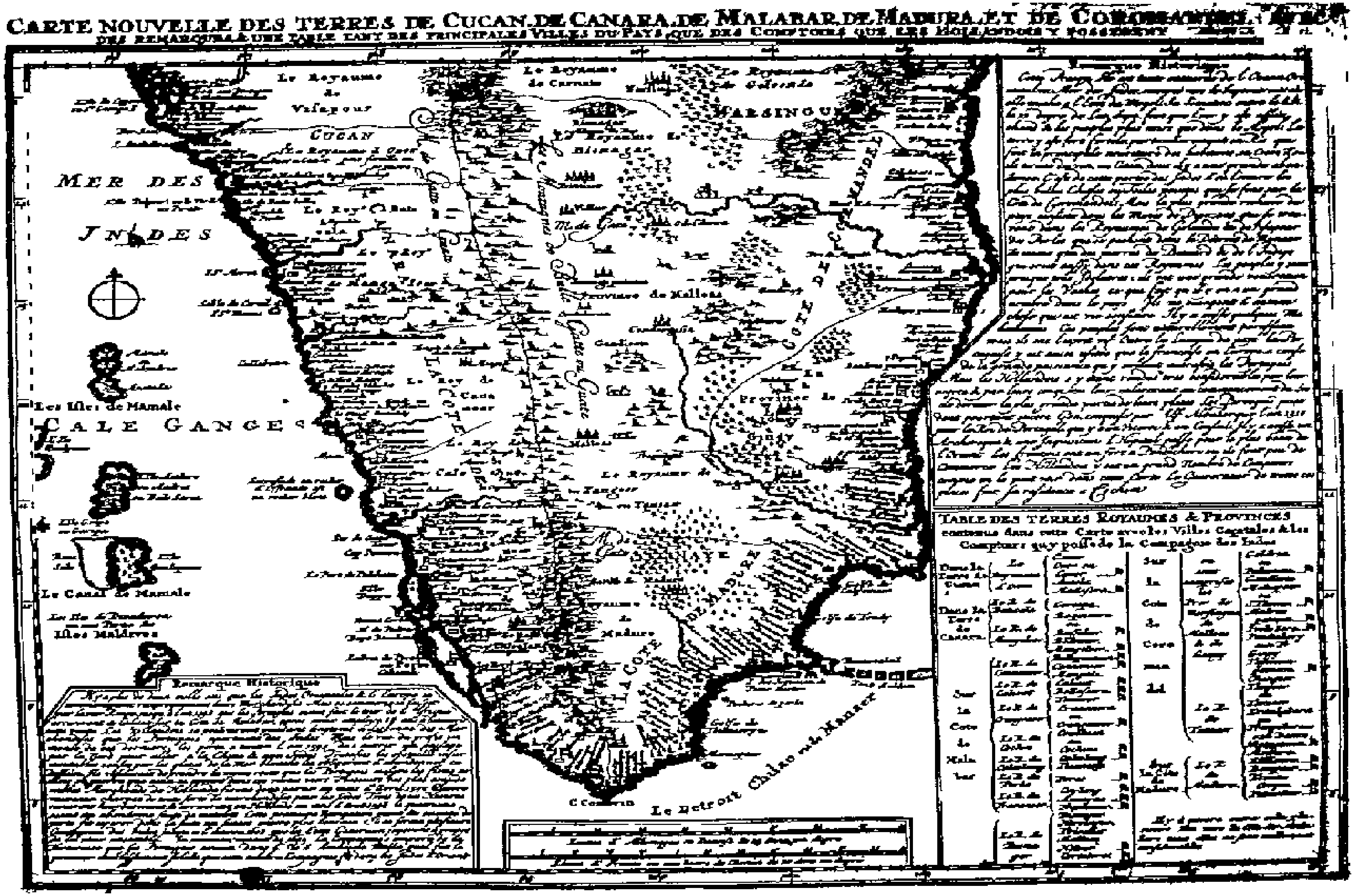
17. Jansson's map of the Bay of Bengal, 1658



18 A Coastal Chart, 1778



19 Moll's map of India, 1717


CARTE NOUVELLE DES TERRES DE CUCAN, DE CANARA, DE MALABAR, DE MADURA, ET DE COROMANDEL
Le Royaume de Visapour
CUCAN
MER DES INDES
Le Royaume de Carnate
Le Royaume de Golconde
NARSINGUE
Les Montagnes de Balle Gatte ou Gate
Province de Mallova
LA COTE
Les Isles de Mamale
CALE GANGES
Le Canal de Mamale
Isles Maldives
Remarque Historique
COTE DE MADURE
C. Comorin
Le Detroit Chilao ou de Manaar
TABLE DES TERRES ROYAUMES & PROVINCES contenus dans cette Carte avec les Villes Capitales & les Comptoirs que possede la Compagnie des Indes

India, but of war on the coast; of war between two European nations, who have not, till very lately, had any connection with the governing people of the country. It has been entirely owing to the war, that any European has been allowed to have any kind of familiar commerce with them, or that the servants of the Company have been admitted to an acquaintance with their courts, the splendour of which has been greatly lessened by the war The war alone has taught them the geography of the country a hundred miles around their settlements, and, within these few years, those who had been at Madura, which is about that distance, were as eagerly listened to when they returned to Madrass and their accounts were as new to all that heard them, as if they had come from Pekin.'

The foreign traders in India had not only been tolerated but welcomed by the ruling powers for the trade they brought and the customs dues they paid. They had required very small forces for their protection and most of the inhabitants of the foreign stations were businessmen or clerks. The sudden increase in protective walls and military personnel was due to the rivalry between the two European groups. Historians of both countries blame the other for being the first to supply arms and advisers to the local kingdoms.

Certainly south India at that time was in a very unsettled state. The Marathas were making sweeping conquests, levying *chauth,* one fourth of the revenues, and then retiring to conquer elsewhere The Muslim rulers in the Deccan and further south had lost touch with Delhi and were not strong enough to rule on their own When the *gadi* of Hyderabad fell vacant the claimants sought help from wherever they could to press their claims. The fact that the French and the British had the best artillery in the land naturally made them desirable partners to any side Thus between 1746 and 1760 there was continuous fighting between the men of the two countries, ostensibly to back claimants to various thrones but in reality to gain supremacy in south India for their own trading enterprises. As reports of the fighting reached back to Europe, there was a demand for correct maps to show the positions of the forts and towns that were being taken and lost. For the first time army engineers were traversing the country, and they had sufficient knowledge to make locations and to draw rough sketch maps.

The English factory at Masulipatnam had been established in 1611 and that at Madraspatam in 1639. Apart from these two small

areas the English had no other territory in the south, until in 1763 the Nawab of Arcot ceded them the district of Chingleput. This was in return for the help given him against the French who had been anxious to place a puppet of their own on the throne. However, after the battle of Wandiwash in 1760 the English had no more to fear from the French. The latter had still their station at Pondicherri and they later lent some support to Hyder Ali and Tipu Sultan against the English, but the dominant power was in the hands of the East India Company

Prior to this period, maps of India were largely a matter of guesswork. Very few locations had been fixed by latitude or longitude, and the measurements supplied by travellers were very vague. So cartographers filled in their maps as best they could, mainly using earlier maps as guidelines and adding the extra places as they heard about them. But as army engineers traversed the country, they were able to take readings for various points and get a new, correct measurement between them. Distances were often calculated with a perambulator This was a small wheel attached to a handle which marked up each mile as it was wheeled along. The length thus obtained was then adjusted for twists and turns in the route and a rough estimate of the distance arrived at Sketch maps were drawn in the field and brought back to the office to be fitted into a large map of the whole area.

D'Anville published his large map of India in 1752. The following year he was able to publish two maps of the south-east coast on a much larger scale (Plates 27 and 28) and wrote, 'This is the part of India where the settlements that support the trade of the Europeans are of the most importance. We might mention different parts of Europe, in which geography is less well informed, than of many places in Choromandell.' His *Eclaircissement,* which accompanied the maps, was translated into English in 1764 by William Herbert and the same year Thomas Jefferys published the map in England with his own *Explanation* Jefferys' opinion differed on many points from that of d'Anville. He was a cartographer and geographer as well as publisher and also drew twelve maps and plans of forts for Cambridge's *Account of the War in India* which appeared in 1761. Robert Orme published the first volume of his *History of the Military Transactions of the British Nation in Indostan* in 1763, with a general map by Thomas Kitchin and an amended version of d'Anville's map of the Coromandel coast. The

second volume appeared in 1778 with four maps. That of the Countries of Indostan, East of Delhi, was taken from Rennell, but Bernoulli wrote in 1786 that Orme did the other three himself Orme also drew three maps for his *Historical Fragments of the Mogul Empire* published in 1782.

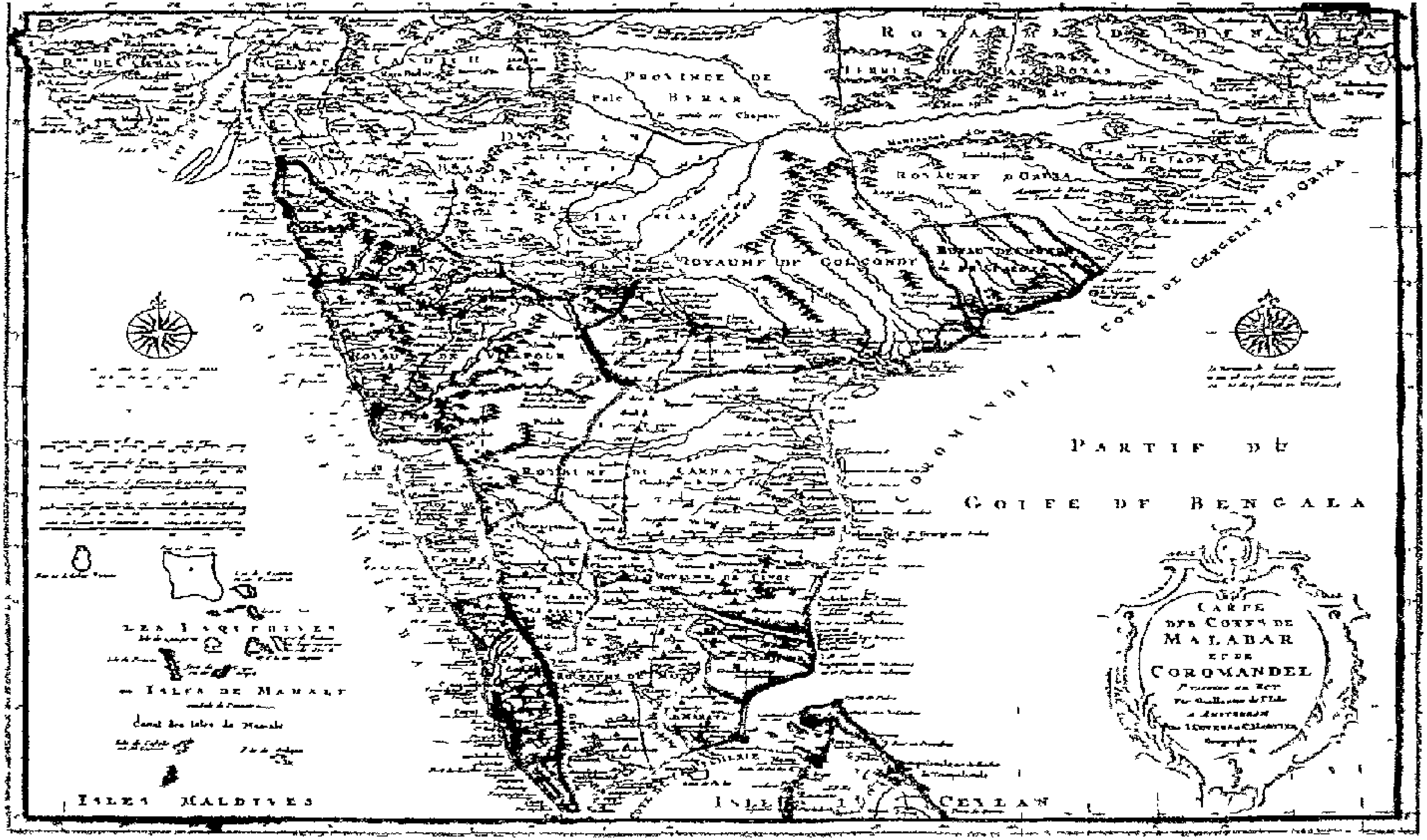
Jean Bernoulli published simultaneously in Berlin and Paris in 1786 a large work devoted to the geography of India. The first volume contained the manuscript of Father Tieffenthaler. Tieffenthaler had sailed to India in 1743 from Portugal and then spent more than thirty years travelling over the country recording the geography and drawing sketch maps. He sent his manuscript to Anquetil du Perron whom he had met in Surat in 1759 Anquetil du Perron was an oriental and linguistic scholar and his researches into the history and chronology of India form the second volume of Bernoulli's work. Bernoulli also included 'Part of a Map of the South of the Indian Peninsula made by some Brahmins' He does not say whether these were Brahmins who had been trained by Europeans to make surveys, or whether they already had the map for their own use.

Tieffenthaler was able to list thirty-two places where a correct reading had been taken. For a long time, without sufficiently exact timepieces, it had been very difficult to fix longitude with any degree of accuracy. But after 1761 the use of the chronometer changed this. Latitude was determined by Hadley's Quadrant and surveys, when they started, were made by compass and chain. Military officers in the field found it very difficult to plan their marches and campaigns without any correct and detailed maps. There was at that time no official department to deal with surveying and those men who were keen started on their own without any financial backing

After the Jagir lands became part of the Company's territory in 1763, Thomas Barnard was sent to draw a correct survey of the Company's land around Madras. But he was not given any equipment or money, as the Board of Directors refused to sanction the expense. However, he completed the field work in the next ten years and submitted the maps to Calcutta for approval They were published in London by Alexander Dalrymple in 1778 In the same year Robert Kelly offered to compile an atlas of south India but again the Board refused to grant him expenses to do so. As he had found it very difficult without proper maps, he proceeded to do the work on his own and in

1782 he took to Calcutta a specimen of the atlas containing sixty-four small sketch maps. Since the Regulating Act of 1772 Bombay and Madras had come under the jurisdiction of Calcutta and Warren Hastings had been made Governor General of the Company's lands in India. Kelly was allotted a small gratuity in acknowledgement of the work he had done and he was commended to the Directors in London. But they did not think it worth while to print his atlas at Company expense.

All the early maps drawn from surveys were printed privately in London. In 1775 Ross had been urging the importance of establishing the post of Surveyor for the Madras Presidency. In 1792 William Topping was asked to take the job but without being given the title or extra salary—there was still no provision for it officially. However, there were frequent letters from London demanding accurate surveys so that the Directors could see what territory they owned. Clive had promised Orme that he would send him maps as soon as he could, and after Rennell returned to London there were orders that all rough maps should be sent home for Rennell to fit into his larger maps. When at last the Company sanctioned money for field workers there were complaints that they were wasting time doing beautifully finished maps when the Company wanted only rough but accurate sketches which could be finished in London. Orders were given that as soon as a sketch map was brought into the office, one copy only should be made, for safety, and the sketch itself should be immediately despatched to London. There was always the fear that if many copies were made they would fall into the hands of the Company's enemies. This caused needless delays between the time an area was surveyed and the time when an officer in the field could have use of a map for the territory he was administering. The average sailing time between London and Madras was five to seven months and ships sailed from London only during the winter months. However, Rennell reported in 1776 that letters sent from Marseilles on 3rd June reached Calcutta on 20th August. They had come by the newly opened Suez route which Hastings had instituted. Passengers, as well as mail, travelled by land to Marseilles, crossed the Mediterranean by boat, travelled overland to the Red Sea and then embarked for India. The Suez Canal was not opened until 1869. It was usually some years between the time a district was surveyed and a printed map of the area was available.



Carte des Costes de Malabar et de Coromandel
Partie du
Golfe de Bengala
Royaume de Golconde
Royaume de Carnate
Province de Bemar
Royaume d'Orixa
Costes de Gergelin et d'Orixa
Les Laquedives
Isles de Mamale
Canal des Isles de Mamale
Isles Maldives
Isle de Ceylan

There was at this time very little contact between the three presidencies The interior parts of the country were unknown to most Europeans and communication between the three was by the sea route. Thus the surveyors of the south were largely ignorant of the progress that was being made in Bengal This progress was due to the work of James Rennell, the father of Indian surveying.

6. The First Surveys

James Rennell was born in Devonshire and came to India with the navy, having volunteered for service in the East Indies. He had shown an early interest in surveying realizing, perhaps, that this was a field where little work had yet been done, and one where he could distinguish himself. When hostilities between England and France ceased, he left the navy and joined the service of the East India Company. By 1767 the need for accurate maps was felt so strongly that a letter to the Board of Directors in London reads: 'So much depends on accurate surveys both in military operations and in coming at a true knowledge of the value of your possessions, that we have employed everybody on this service who could be spared and were capable of it. But as the work must ever be imperfect while it is separate and unconnected plans, we have appointed Captain Rennell, a young man of distinguished merit in this branch, Surveyor General, and directed him to form one general chart from those already made, and such as are now on hand as they can be collected in.' So James Rennell became the first Surveyor General of Bengal and received the handsome salary of Rs 300 per month

Prior to this period, there was little planning or direction in the few maps that had been drawn from actual measurement on the ground. Mostly they were the work of missionaries or army engineers who happened to take an interest in this line. But with the appointment of Rennell this was to change. After the Company had been granted the 24-Parganas as a result of the battle of Plassey, and later, by the Nawab of Bengal, the provinces of Chittagong, Burdwan and Midnapore, the local Council, with encouragement from London, wanted to know the extent of the cultivated lands, both for collection of revenue and for communication. In the south the need for maps had been felt by those planning military campaigns, but in Bengal

systematic surveying was first undertaken for civil and financial purposes.

By 1773 the survey of the Company's possessions was complete, and for three years Rennell settled in Dacca to compile maps from the thousands of rough sketches drawn in the field. By then his health was no longer able to withstand the rigours of the climate and he was permitted to return to England on a pension; he remained advisor to the Company for the next fifty years.

As soon as Rennell reached London he set about getting the maps for his *Bengal Atlas* engraved This had to be done at his own expense, as the Company was not willing to pay for the publication of maps As far as they were concerned sketch maps, copied laboriously by hand, were sufficient for the officer in the field. However, they generously allowed some advance of money to Rennell, and once the Atlas was printed they permitted copies to be transported in their ships free of charge for sale in India Any servant of the Company who felt the need of a map for his work had to buy it himself—the Company did not think it was their duty to supply him with it.

The first of Rennell's maps to be published under his name was 'A map of the Eastern parts of Hindoostan containing the Subahs or Kingdoms of Bengal, Bahar, Awd and Ellahabad' which appeared late in 1776 Some months earlier the Court of Directors had permitted Sayer and Bennett to publish a similar map, dedicated to themselves by Andrew Dury, with no mention of Rennell's name.

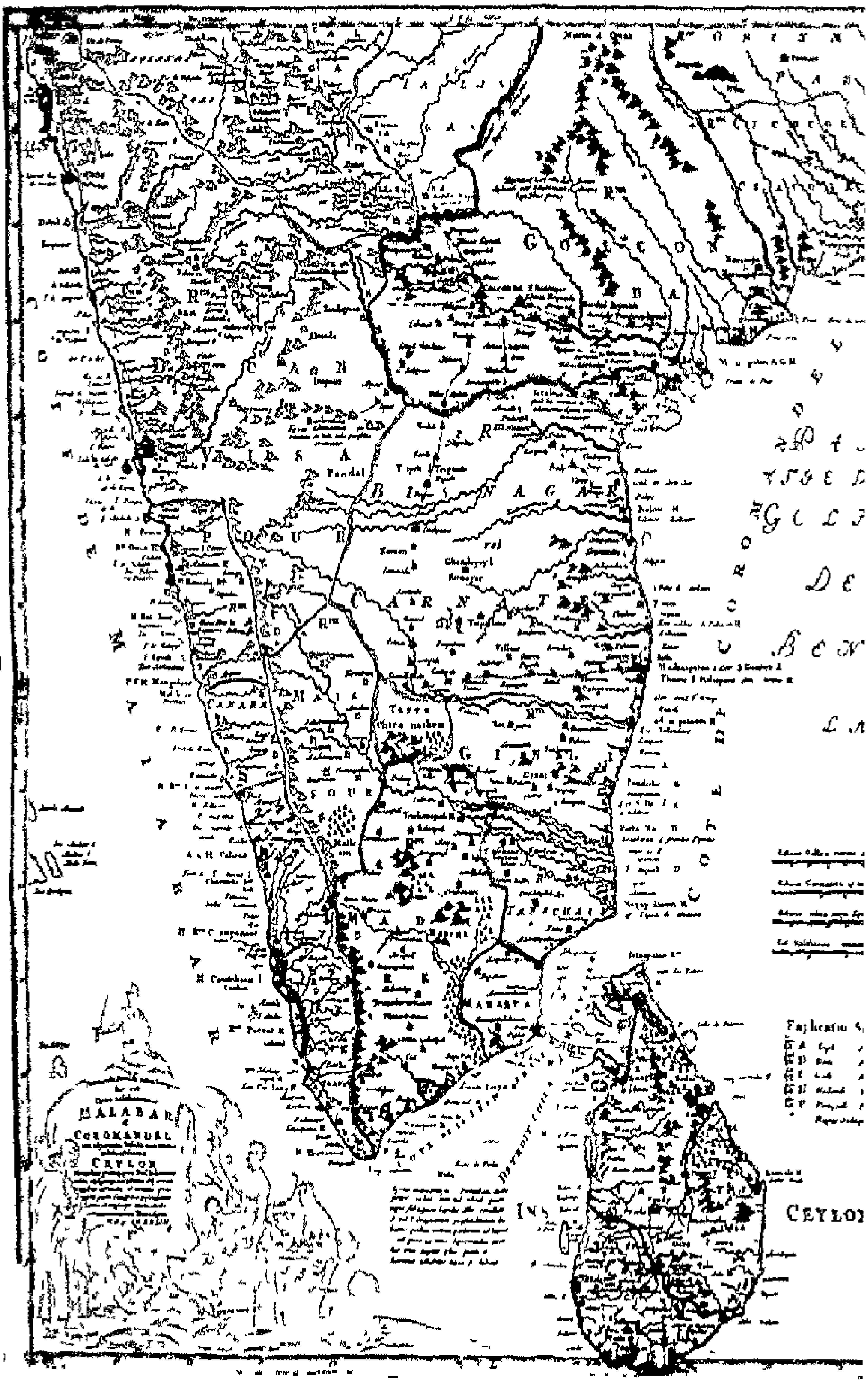
A similar map called 'A Map of Bengal and its Dependencies Collected chiefly from Actual Surveys and now First Published' had already appeared under the name of William Bolts in 1772. This William Bolts had been deported from India in 1768 as an undesirable character—one of the few civilian employees of the Company to be so treated. He had apparently exceeded the limits of private trade, a difficult task in that time of lawless extortion On his return to England he published at his own expense his *Considerations on Indian Affairs,* using the map as a frontispiece, in which he attacked the Bengal Government. As Bolts had done no surveying himself, and was not in a position to receive the sketch maps of the engineers employed in the field, it is likely that he secretly obtained copies and managed to get them printed in London before the official maps were released. The map itself is very incomplete. The areas for which Bolts had obtained

sketch maps are well detailed, but there are large blank spaces, with only major towns marked

However, the map aroused sufficient interest for Bolts to have it re-engraved the following year and sold as a separate sheet map. This time he dedicated it: 'To the Right Honble Frederick Lord North, First Lord of the Treasury, the Right Honble Thomas Harley, Major General Burgoyne, Sir Wm Meredith, Bart, George Johnstone Esqr and the rest of the Members of the Secret and Select Committees of the Honble the House of Commons on Indian Affairs, whose Names, for their disinterested researches, the Natives and the Oppressed in India, may eventually have reason to venerate, so long as the British maintain their Empire in Asia' These were the people in London whom Bolts was trying to convince of his innocence and of the mismanagement of Bengal by the East India Company. He eventually lost his case, having spent in his defence all the money he had managed to save.

Rennell's major work was the *Bengal Atlas.* This was first published in 1779 and contained eight large maps (Plate 32) of the different districts, and one general map of Bengal and Bihar, 'comprehending a Tract more extensive and Populous than the British Islands'. It was immediately re-issued the following year with four more maps and a year later with an additional eight maps giving details of the rivers and their navigation The same year he also published a smaller edition with folded maps that could be easily carried by men in the field. The *Bengal Atlas* was the standard map of Bengal for more than fifty years and there were many reprints. It was usual to keep the original Title Page with the date of 1781, but the water mark on the paper shows that the maps were actually printed at later dates.

By 1782 Rennell had been able to collect sufficient material to publish a large map of Hindoostan. Along with the map he also published a *Memoir,* giving detailed accounts of how he had arrived at the placing of the various geographical features. He traced the maps of India from earliest times, much as d'Anville had already done in his *Eclaircissement* in 1753. By this time, of course, it was much easier to gain precise knowledge of a wider area. The British were already in control of most of eastern India, and in the south their armies, fighting against Tipu Sultan, had been traversing the peninsula for several years The number of sketch maps from which Rennell could piece together his



22 Homann's map of the Peninsula 1733

large map of the subcontinent had increased tremendously, and he was given full cooperation by the Company in London

A new edition of the *Memoir* was published three years later, with several fresh maps, one of them being drawn from the sketches of surveyors who accompanied Col Fullarton and Col Humberstone on their marches against Tipu's armies The large map of India was completely redrawn in 1788 incorporating all the new knowledge that had been sent to London in the meantime An account of north-west India had been furnished by George Forster after his adventurous journey overland from Benares through Persia to Russia and eventually to England, and this was included in a new edition of the *Memoir* in 1792 By now the *Memoir* contained 614 pages and was of more use than the map itself, which became out of date even before a new engraving could be done British rule was expanding so fast and with it the chance for surveyors to draw accurate maps from measurement and astronomical calculation

Rennell was well established in London as the official geographer for the East India Company In this position he was able to advise the Company on which maps were worth financing and which ones were of no import One casualty of his decisions was the large map by Charles Reynolds Reynolds had come to India at the age of fourteen and immediately joined the army in Bombay While taking part in campaigns against the Marathas and Tipu Sultan he became interested in making surveys and in 1783 was appointed Surveyor to the army As the Company owned so little land around Bombay they saw no need to appoint a Surveyor General for the region and it was only after repeated requests that the post was created in 1796 and Reynolds appointed In the meantime he had devoted himself fully to the task of surveying as large an area as possible He himself made many trips inland, quietly taking measurements of the Deccan area without letting it be seen that he was making a survey At this time the British were hoping to detach the Marathas from their alliance with Tipu Sultan, and were against any seemingly suspicious moves that might upset this plan

Reynolds was the first to make extensive use of Indian employees in his surveys He had earlier applied to the Company for copies of the surveys that had been made so far, but the reply came that his map was to be drawn entirely from his own knowledge and not to depend

on the work of others. He therefore instructed his employees in their duties and sent them far afield to bring back reports of roads and measurements which he then filled in on his map of India. The Company objected to this large expenditure, but they objected even more to Reynolds paying them himself from his own pocket: 'If the native Surveyors are to be so deployed . the expence should be regularly paid by the Company, and not defrayed by an Individual at his own expence, who would thereby have a Claim on the Company *hereafter to an unlimited extent, without any vouchers for the* Expenditure.'

It is possible that it was these employees of his who made maps for the Marathas Several manuscript maps are extant, mainly of fortified places, some of a wider area, all of places of a military interest to the Maratha armies The majority of them have east at the top of the page, rarely is any scale shown, the writing is mostly in Modi script, and they appear very crude beside those of the Company surveyors Much research will be required to date them, and nothing is known of the cartographers How much they owe to English or Portugese surveyors is also not established, but they are interesting as early examples of Indian maps.

Reynolds worked on his map for fourteen years and a friend wrote: 'In his hall I had the gratification of crawling over a map fourteen feet long and ten feet broad; to do which, without injury to a production intended to be presented to the Court of Directors, he furnished me with silk stockings for hands and feet'. This major work was unfortunately never published and no copy is known to have survived, although it formed the basis for all maps of western India for many years.

Another large map of which no copy is now known to exist was that of Thomas Call By 1787 Call had nearly completed an Atlas of India in twenty sheets which were to be put together into one general map on a smaller scale The Council were very pleased with it and ordered a fair copy made to be hung in the Council Room in Calcutta for constant reference. Call returned to England the following year and died shortly after Nothing is now known of his map on which he had spent so much time and effort

In view of the parsimony of the East India Company the fact that so many surveys did survive is in large part due to the work of two

men, Alexander Dalrymple and Robert Orme. Both were tireless in their demands for charts and sketch maps. Coming from well-known families and in a position to know the leading figures of the day, they were able to collect and make use of a large number of sketches. In 1791 Dalrymple began publishing his *Oriental Repertory* in which he printed many maps and charts which might otherwise have been lost, and also letters and treatises which he had in his possession, and others which he was able to obtain. He also published many collections of charts which were bound up differently in every case according to the requirements of the purchaser.

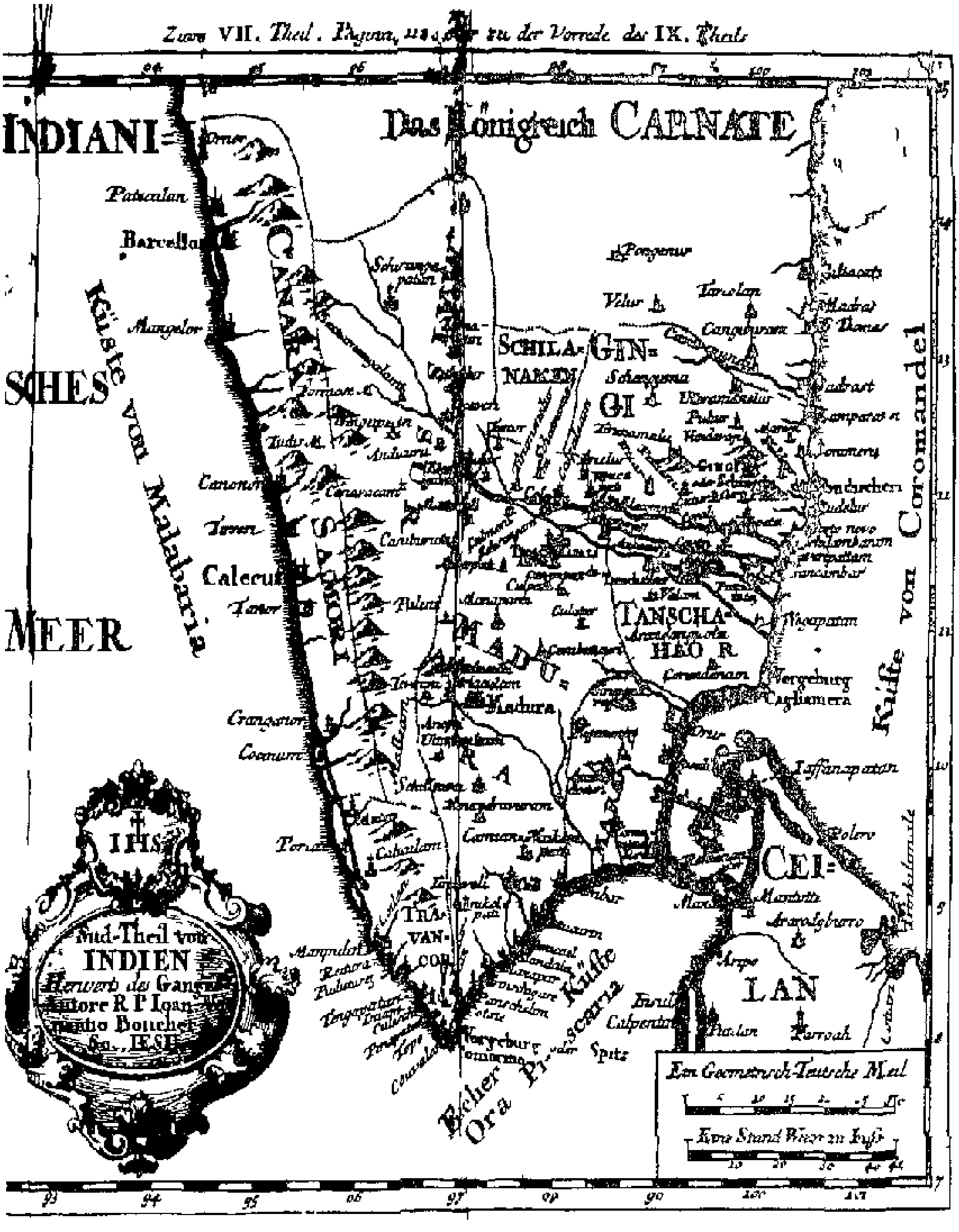
Robert Orme was a personal friend of Clive He was in India in the employ of a mercantile firm from 1743 until 1758, first in Calcutta and then in Madras. It was his repeated requests to Clive to furnish him with exact maps that initiated Rennell's survey of Bengal. Clive and his successor Vansittart took such a personal interest in the compiling of an accurate survey that they incurred the displeasure of the Board. There were complaints that they were keeping to themselves maps that had been drawn at the expense of the Company and when Rennell came to London he stated that he was not able to make use of all surveys as Orme was unwilling to part with some of them. Orme soon handed them over, however, as he found the expense of compiling and engraving a detailed large-scale map of India was more than he could undertake, particularly when the Company was willing to pay Rennell for the same task.

While all this detailed and painstakingly acquired knowledge was gradually being put together, many publishers were still issuing maps which were long out of date. Thus Bonne in France and Zatta in Italy were still engraving, and presumably selling, maps which bore no evidence of the recent surveys, but were copies of those produced in the previous century. Even Ptolemy's name still exerted such an influence that Mercator's edition of his atlas was reprinted as late as 1730.

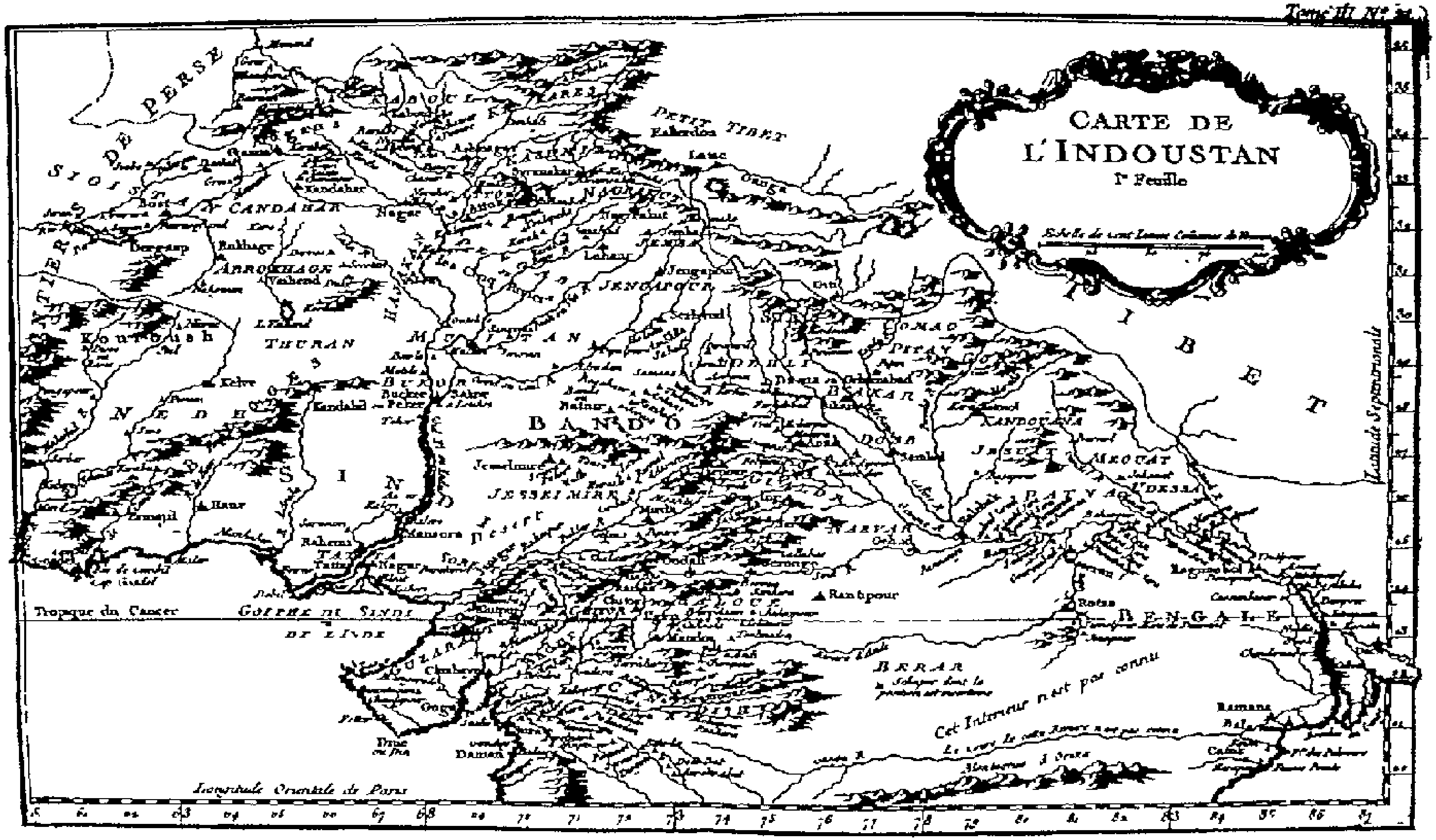
7. Triangulation

The days of maps drawn from route surveys came to an end by the beginning of the nineteenth century, except for distant inaccessible areas. Triangulation was first used on a large scale in France in the middle of the eighteenth century and it took forty-five years of laborious work to complete the geometric map of France. William Lambton was the first in India to make use of this method, and he began work in Madras in 1802. He measured a base line seven and a half miles long between St Thomas' Mount and Perumbauk Hill by the use of chains and built up triangles across the Mysore plateau. With a second line measured at Bangalore, he was able to carry his triangles right across the peninsula. In this way he discovered that the actual width of the peninsula at this line was 360 miles and not 400 as all earlier maps had shown. This required the adaptation of previous surveys into the narrower width. He was able to complete the triangles for the whole of south India and much of central India, although Rennell in London advised the Board that triangulation was a waste of money and route surveys were quite accurate enough Lambton's allowance was considerably cut as a result of this advice.

The triangulation surveys fixed points accurately throughout the subcontinent and it was then the work of the topographical surveyors to fill in the outline with particulars of rivers, mountains, roads and other details. By now the value of accurate surveys and maps was recognized, and as the British conquered more of the country, so their knowledge of it was transferred to the maps. The next important survey to be undertaken was the Revenue Survey, for purposes of fixing boundaries of estates for taxation and claims of ownership. This was followed by a Geological Survey and later an Archaeological Survey. Once the physical features of most of the country were laid down, the maps could easily be adapted for different purposes.



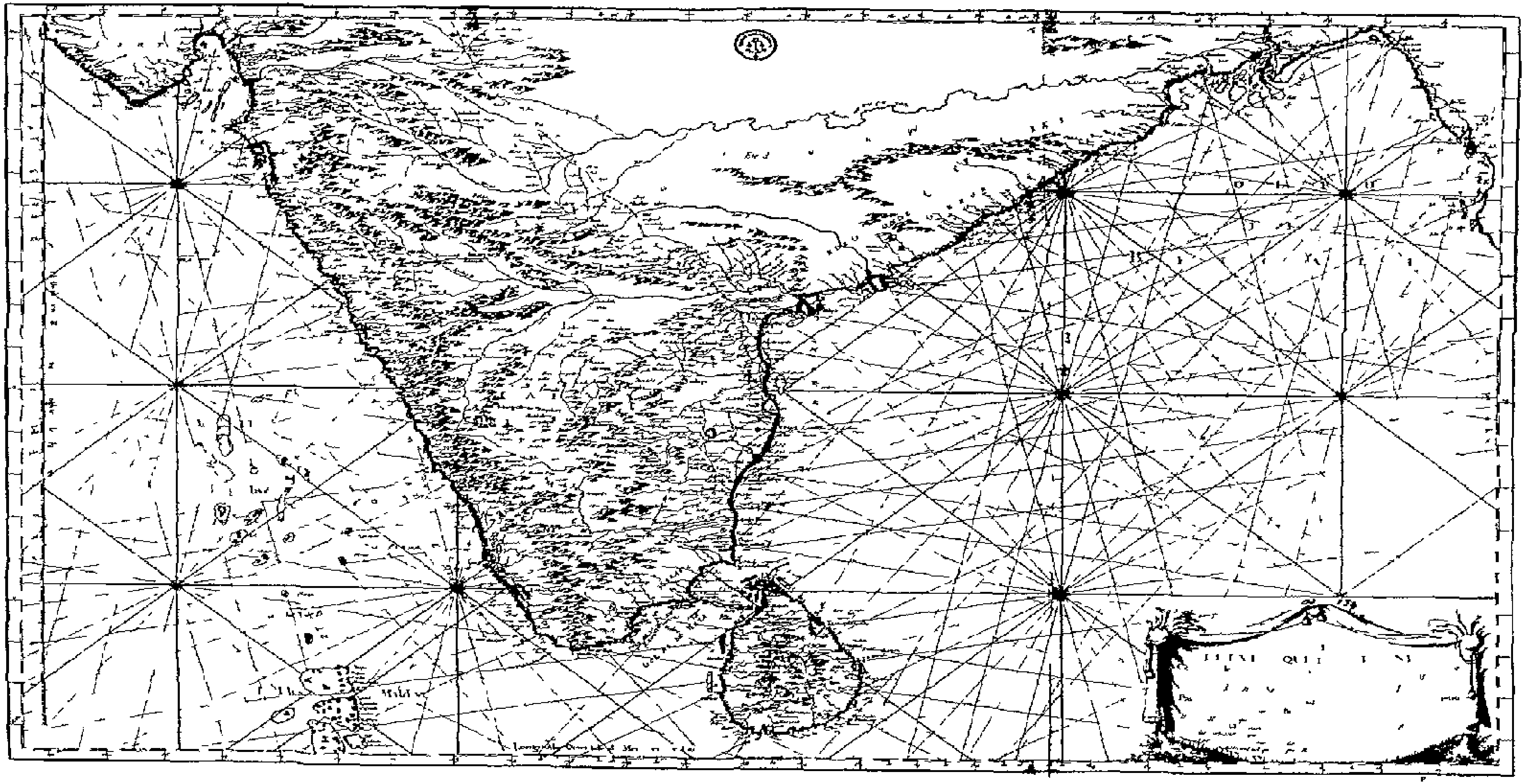
A German copy of Bouchet's map first drawn in 1719



24. Bellin's map of north India, 1740

Tome III N° 40

NOUVELLE CARTE DU ROYAUME DE BENGALE
ROYAUME DE BENGALE
ROY DE RAGIAWERRA
ROY DE COS ASSAM
ROY DE JESUAL
ROY DE COS BHAIR
ROY DE MEVAT
ROY DE TIPERA
ROY D ASOE
ROY DE ODAVASCAM
ROY D'UDESSE
PROV DE BOLLUA
ARRACAN
ROY DE NARVAR
ROY DE MALVA
ORIXA
PROVINCE
LE GOLFE DE BENGALE
Latitude Septentrionale
Longitude de l'Isle de Fer



26 Bellin's map of the Peninsula, 1766

For long all surveys continued to be sent back to England in a rough state to be fitted into the larger maps there However, by 1866 the method of quick reproduction by photo-zincography was in use in Calcutta and Markham records that in the year 1868-9 44,092 were struck off by this method and 97,647 lithographed Thus as soon as a survey was completed it could be reproduced for use in the field almost immediately

Until about this time too the maps themselves were printed in London After Rennell's map of Hindoostan, the next large map was that drawn by Aaron Arrowsmith and published in 1816 On a scale of *16 miles to an inch, it was made up of nine sheets and was the last* major map to be based solely on route surveys By 1822 Arrowsmith was able to bring out a map of south India from Cape Comorin to the Krishna River based on the triangulation surveys of Lambton It consisted of eighteen sheets on a scale of four miles to an inch He then planned an atlas for the whole of India, to extend from Karachi to Singapore, to be made up of 177 sheets each measuring 40 × 20 inches on a scale of four miles to an inch Unfortunately he died before it could be started His place was taken by John Walker, a very fine engraver whose father had worked under Dalrymple

Walker began work on the Indian Atlas in 1825 and the first sheets, based on those of Arrowsmith for south India, were published two years later The work continued steadily until in 1869 it was decided that it should be transferred to Calcutta By then Walker had engraved the plates for 84 sheets The maps were continually being up-dated as new knowledge was brought in, especially of the Himalayan areas After the triangulation surveys were complete, it often took years for the other details of topography to be correctly charted

Apart from the Indian Atlas Walker also engraved many other maps of India These included seven maps of the triangulation surveys, a map on six sheets published by Allen, a skeleton map on six sheets for the Government, Simm's large plan of Calcutta on four sheets, surveys of Jammu and Kashmir, surveys of the Hyderabad Circars, and many others These are some of the maps of India, but his name is listed for fine engraved maps of most parts of the world, so his output must have been prodigious Of course all the work was not carried out entirely by him, but to keep up his standards he must have maintained strict supervision over his staff

The nineteenth century maps and atlases are bare of the adornment of the preceding centuries. However mention must be made of Tallis' Illustrated Atlas of about 1850. The maps are small but finely engraved with charming vignettes of local places of interest. Three of them are of India (Plate 29). Other publishers such as Thomson, Teesdon, John Arrowsmith and Wyld published many maps of India during the first half of the nineteenth century. Once the basic geography had been established it was easy for any publisher to make use of a map and adjust it to his particular requirements whether it was to be sold as a sheet map or as an illustration for a book.

Nowadays maps of all parts of the world are easily available, and drawn to all scales Rivers may change their course, and landslides may cause a new lake to be formed, or an existing one to disappear, a village may grow into a town, or political boundaries change. These can soon be put right in the maps, either by surveying on the ground or by aerial photography. The magic and the mystery of unknown lands has gone out of our lives. Thus the maps of bygone days can give us some idea of the challenges faced by the intrepid adventurers who travelled in distant places and shared their knowledge with the people at home.

Maps of India Printed Before 1800

The maps in this catalogue are all in the British Museum or in the National Maritime Museum, Greenwich, unless otherwise stated Many show areas larger than present-day India, as the political divisions of India, Pakistan and Bangla Desh are of such recent origin. The early Ptolomaic tables have not been included, nor have maps of India Orientalis, which, at the time, signified the whole of Asia, sometimes as far as Outer Mongolia

Measurements are in centimetres, being the width by the height of the printed surface, excluding the blank margins. Where the book or atlas containing the map is mentioned, it is by the author of the map, unless otherwise stated

1. 1513 Waldseemuller **Tabula Moderna Indiae** woodcut 50.5 × 40
   In Strassburg edition of Ptolemy
   Another edition 1520
   Reduced edition 1522, decorated by Laurentius Frisius, with King of Narsinga sitting on throne. No page no. 44 × 29 5
   Another edition 1525, decorative panels on reverse more ornate, page no. 44
   Another edition 1535, heading **Tabu Moder Indiae**
   Another edition 1541, heading **Tabula nova utriusque Indiae**

2. 1548 Gastaldi (Giacomo) **Calecut Nuova Tabula** 17.5 × 13
   Italian text on back, page no. 50 in Venice edition of Ptolemy
   Enlarged edition 1561 24 × 18
   Another edition 1562, as above, 55 in ordine

Another edition 1564, page no. XXVII Dd
Another edition 1574, page no. 29 Ff

3 1561 Gastaldi (Giacomo) **Il disegno della Terza parte dell' Asia** Girolamo Olgiato F. 56.5 × 40.5
Another edition 1578 in De Jode's *Speculum Orbis Terrarum* showing a larger part of Asia. On back Asia Tertia Pars vel India 50 × 32 5
Another edition 1593, on back Asia Tertia Pars sive India

4 1565 Gastaldi (Giacomo) (Map of Hindustan)'Seconda Tavola' South at top of page 34 × 27.5
In Ramusio's *Delli navigatione*

5. 1565 Bertelli (Fernando) (Map of Hindustan) 'Seconda Tavola' 'Fer. Bertoli exc' 34 × 27 5
As above, but omitting two fish near top margin

6. Braun (Georgius) and Hogenburg In *Civitates Orbis Terrarum* Latin text

a) **Calechut, celeberrimum Indiae emporium** 46 5 × 18.5
b) **Canavar** 15 5 × 14.5
c) **Diu** 47 5 × 9
d) **Goa fontissima Indiae urbis in Christianorum potestatum** 47.5 × 13

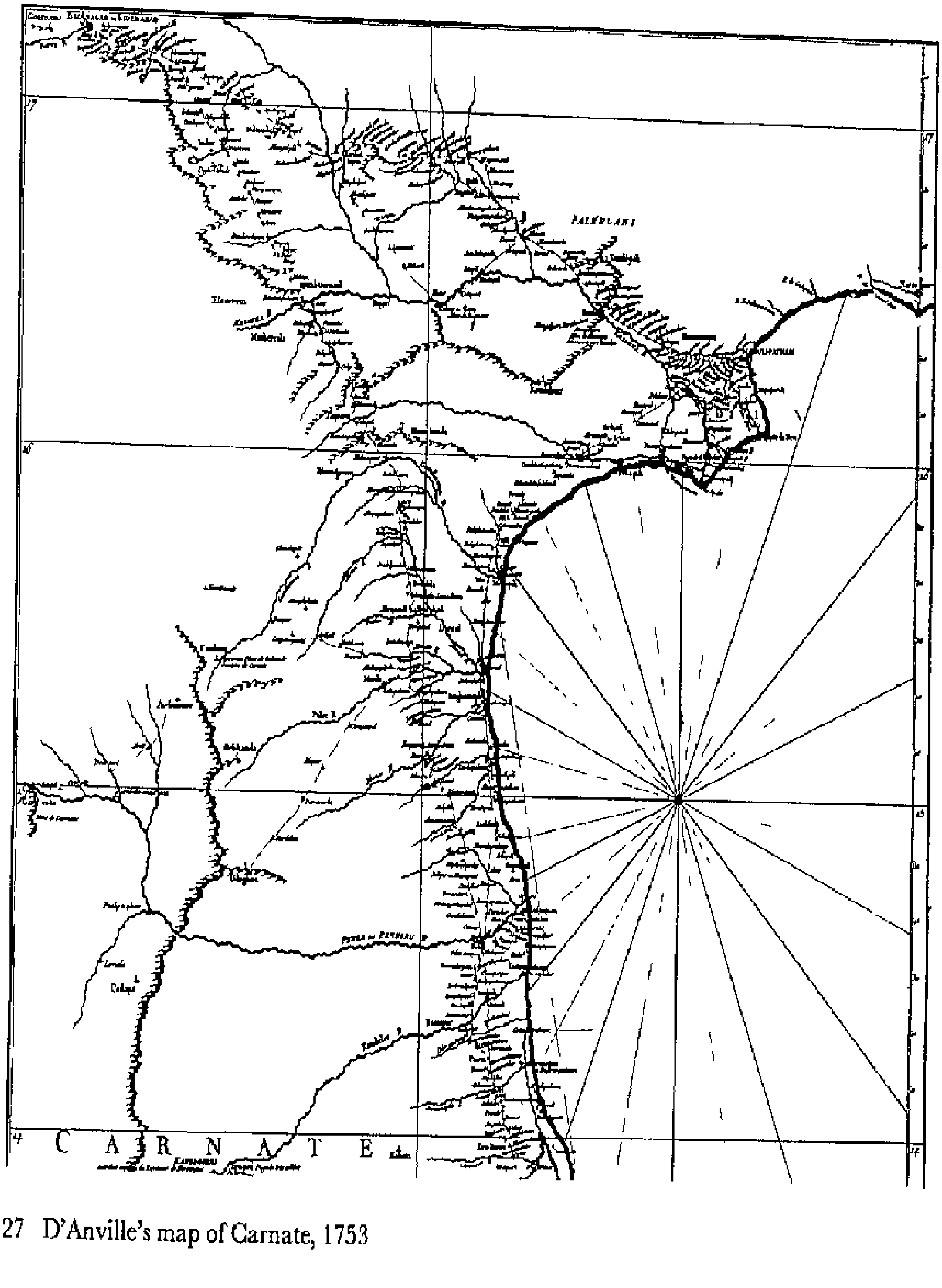
Many other editions up to 1624

7. 1596 Linschoten (J H. van) **A Ilha e Cidade de Goa Metropolitana India** 80 × 56
In *Itinerario, Voyage ofte Schipvaert*
Other editions in 1599, 1614, 1623, 1638, and 1644
Reduced edition 1601 showing central portion only 43 × 38 5

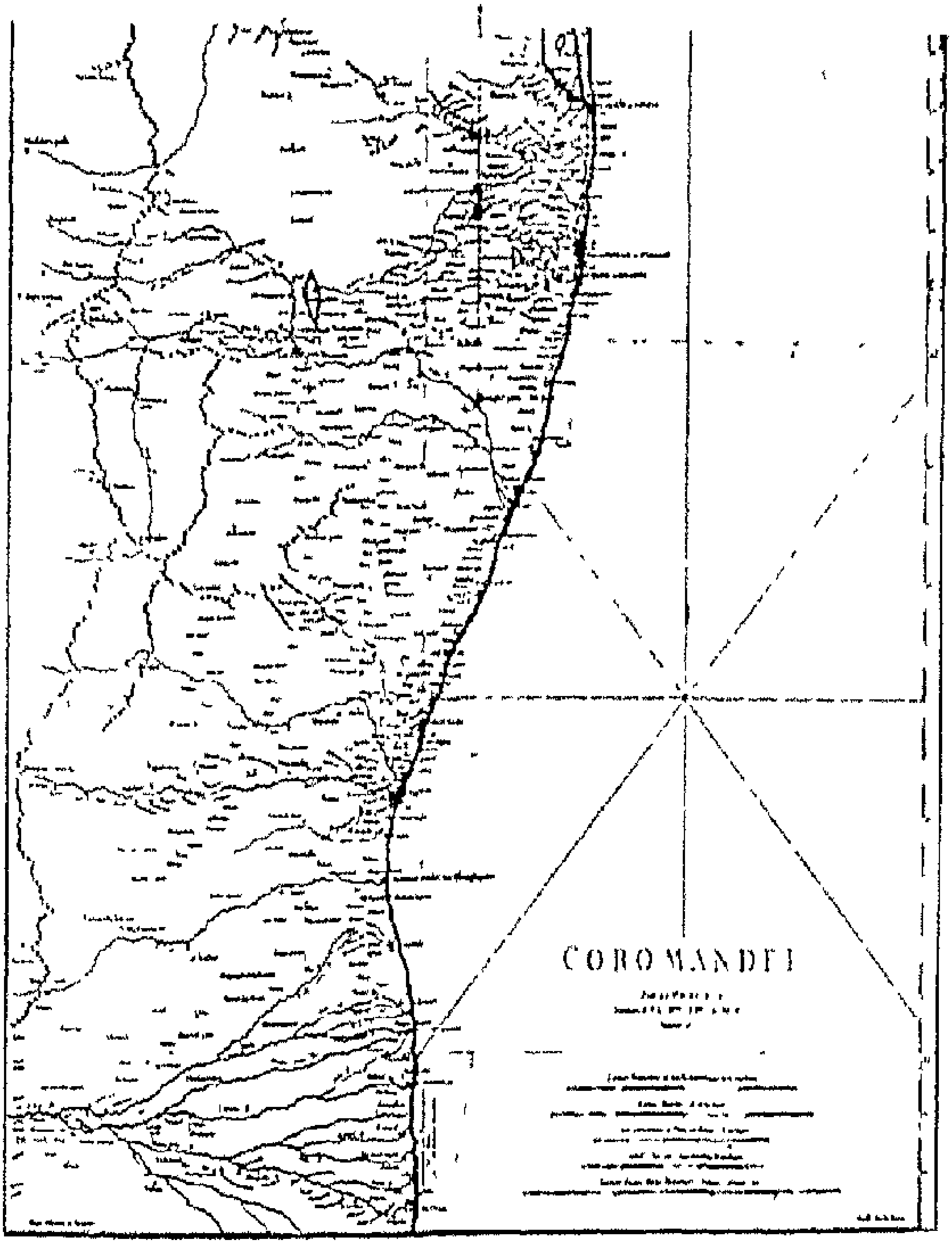
8 1596 Linschoten (J.H van) (Map of India, Arabia, and part of Africa) Very decorative In *Itinerario* 53.5 × 38.5

9 1598 Langenes (Barent) In *Caert Thresor* All about 12 × 8 5

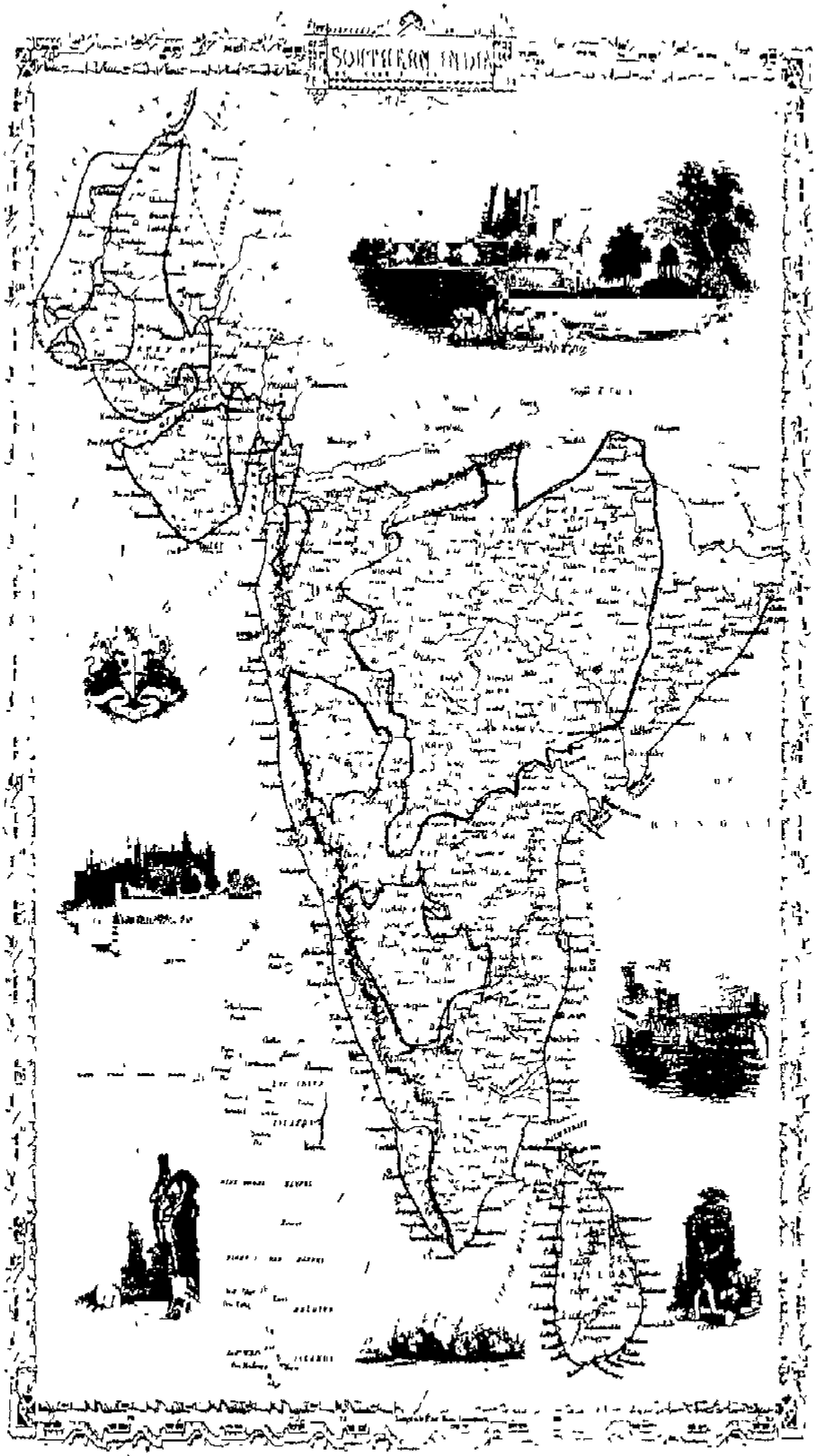
a) **Bengala** page no. 69
b) **Malabar** page no 75, east at top of page



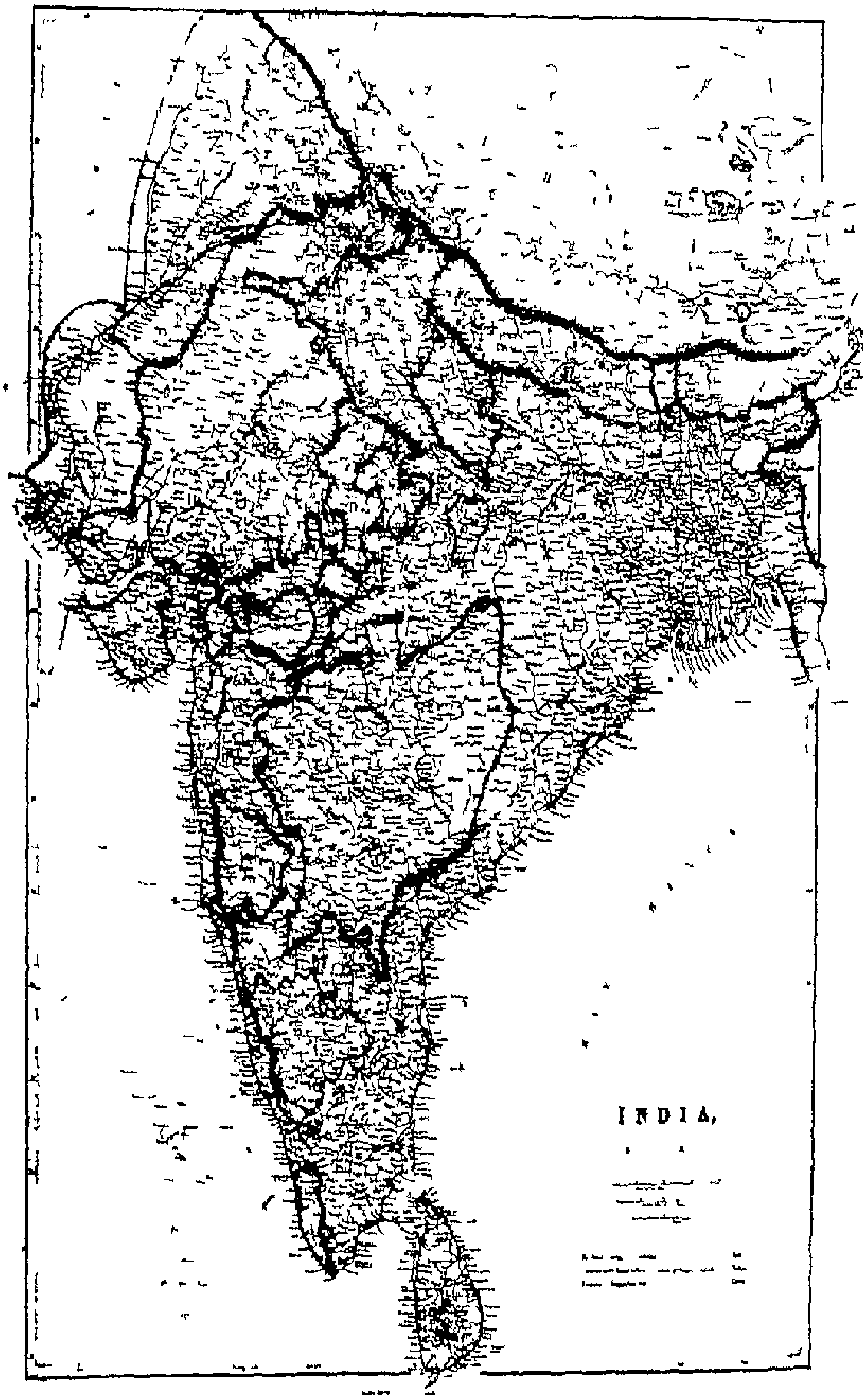
27 D'Anville's map of Carnate, 1753



28 D'Anville's map of Coromandel, 1753



29 Tallis's map of the Peninsula, 1850



30 Arrowsmith's map of India, 1832

c) **Narsinga et Ceylon** page no 79
d) **Cambaya** page no 85

Another edition 1599, with degrees of latitude and longitude marked
c) is newly engraved
Other editions 1600 (Dutch text), 1606 (Latin), 1609 (French), 1612 (German)
Another edition 1616 by Jodocus Hondius II 13 × 9
e) **Cambaia** page no 722
f) **Malabar** page no 724
g) **Narsinga** page no 730
h) **Bengale** page no 732
Another edition 1649 by N J Visscher, and 1650 a re-issue of 1612 German edition

10 1619 Baffin (William) **A Description of East India, conteyinge th' Empire of the Great Mogoll** 48 5 × 38 5
'Renold Elstrack Sculp Are to be Sold in Paul's Church yarde by Thomas Sterne, Globe maker'
Another edition 1632 'Printed for Henery Toombes and Beniamin ffisher'
Another edition 1625, re-engraved by R Elstracke for *Samuel Purchas his Pilgrimes* 36 × 27 5
Another edition 1663, in Thévénot's *Relations de divers voyages Curieux*, 'J de Bis sculp'
Reduced edition 1655, in Terry's *A Voyage to the East Indies* 30 5 × 27
Other editions 1665, in supplement of Haver's translation of Della Valle's letters, and 1677 edition of Terry

11 1625 Hondius (Henricus) **Magni Mogolis Imperium** 49 × 37
'Amstelodami Apud Henricum Hondium' In Mercator's *Atlantis Novi* Pars Tertia
Other editions 1638, 1644 (Latin), 1639, 1641 (French)

12 1638 Blaeu (Ioan and Corn) **Magni Mogolis Imperium** 52 × 41 5
Many editions up to 1672

13 1639 Jansson (Ioan) Magni Mogolis Imperium 49 × 37
Copy of Hondius' map of 1638. Many editions up to 1666

14. 1652 Sanson d'Abbeville L'Empire du Grand Mogol 24 × 19

15. 1652 Sanson d'Abbelville Presqu'Isle de l'Inde deça le Gange où sont les royaumes de Decan, Golconde, de Bisnagar et le Malabar 24.5 × 19

16 1654 Sanson d'Abbeville L'Inde deça et delà le Gange 54 × 34
Many editions of these three maps

17. 1657 Jansson (Ioan) In *Theatrum in quo visuntur Illustriores Hispaniae Urbes* Part VIII
a) Goa, orientalis indiae metropolis et emporium celeberrimum 44 5 × 32.5
b) Calechut, Cananor
a) is included in De Wit's *Theatrum Praecipuarum totius Europe* after 1693, and in Aa's *Le Galerie Agréable du Monde*, 1729

18. 1658 Jansson (Ioan.) Sinus Gangeticus vulgo Golfo de Bengala In *Novus Atlas*, west at top of page 54 × 47

19. 1665 Doncker (Hendrick) De Golf van Bengala 52 × 43
In *Atlas del Mundo* Many editions up to 1712

20. 1667 Blome (Richard) A General Mapp of the East Indies, comprehending the Estats or Kingdoms of the Great Mogol, the Kingdoms and Estats of Decan, Golconde, Bisnagar, Malabar etc in the Peninsula of India without the Ganges. 'By Monsr Sanson . .. rendered into English and illustrated by Ric. Blome.' In Blome's *Geographical Description of the World* 1670 37 × 40.5

21 1672 Baldeaus (Phillipus) In *Naauwkeurige Beschryvinge van Malabar en Choromandel* are the following:
a) Descriptio Nova imperii Malabar, Canara, Decan et Aliarum Provinciarum, east at top of page 36 × 29

b) **Amadabath** 35.5 × 28

c) **Suratte** 35 × 28

d) **De Stad Diu** 16.5 × 12.5

e) **Goa,** view and plan 35 × 28

f) **Cranganor,** three views 35 × 28

g) **Die Stadt Couchin** 35 × 27

h) **Die Stadt Couchin,** three views 35 × 28

i) **Die Stadt Coulang** 35 × 28

j) **Tutecoryn** 35 × 28

k) **Regionum Choromandell Golconda et Orixa. Nova et accurata descriptio,** west at top of page 36 × 29

l) **Negapatam** 35 × 28

m) **Paliacatta of Gesdria** 35.5 × 27

n) **Masulipatam,** view 34.5 × 27

Re-issued 1747 in Churchill's *Collection of Voyages and Travels* Vol. III, page nos. 641–54. In English, 1672

22 Duval (Pierre) a) **Route de Surat à Mazulpatan par Orengabat et Golconde tenue par l'évèque d'Heliopolis l'an 1663** 23 × 16

b) **Route et itinéraire de Goa à Visapour et de Visapour à Dabul, tiré de la relation du Voyage de Mandeslo faite l'annee 1658** 23 × 16

23. 1696 Coronelli (Vincenzo Maria) a) **Impero del Gran Mogol** 60.5 × 45

b) **Penisola dell'Indo di qua del Gange e l'isola di Ceilan** 65 × 45

c) **Golfo di Bengala** and **Mare l'India** 28 × 27

In tomo II part II *dell'Atlante Veneto*

24 1698 Fryer (John) In *A New Account of East-India and Persia*

a) **A Map of the Parts of India mentioned in Dr Fryar's Travells** 18 × 28

Inset 'Chaul to Raree' and 'Baceim to Ieneahpur', page 50

b) (Map of Bombay), on back page 59 15 × 21

25. 1700 Lea (Phillip) In *Hydrographie Universalis*

a) **Bum-bay, Surat etc** 16 × 13

b) **The River Ganges** 15.5 × 13

26. 1701 Moll (Herman) India, or the Mogul's Empire 19 × 17
In *A System of Geography*

27 1703 Thornton (John and Samuel) The following charts appear in this and/or later editions of *The English Pilot*·

a) A new mapp of the Island of Bombay and Salsett

b) A large Draught of part of the Coast of India from Bombay to Bassalore

c) A large Draught of the Malabar Coast from Bassalore to Cape Comaroone 127626

d) A New and Correct Chart ... from Point Palmiras to Hughley in the Bay of Bengala

e) A Mapp of the Great River Ganges as it emptieth it selfe into the Bay of Benagal

f) A large Chart of part of the Coast of Guzeratt and India from Diu Head to Bombay

g) A new Chart of part of the Coast of Chromandell from Armegaon to Bimlepatan

h) A new Chart of the Coast of Orixa and Golconda

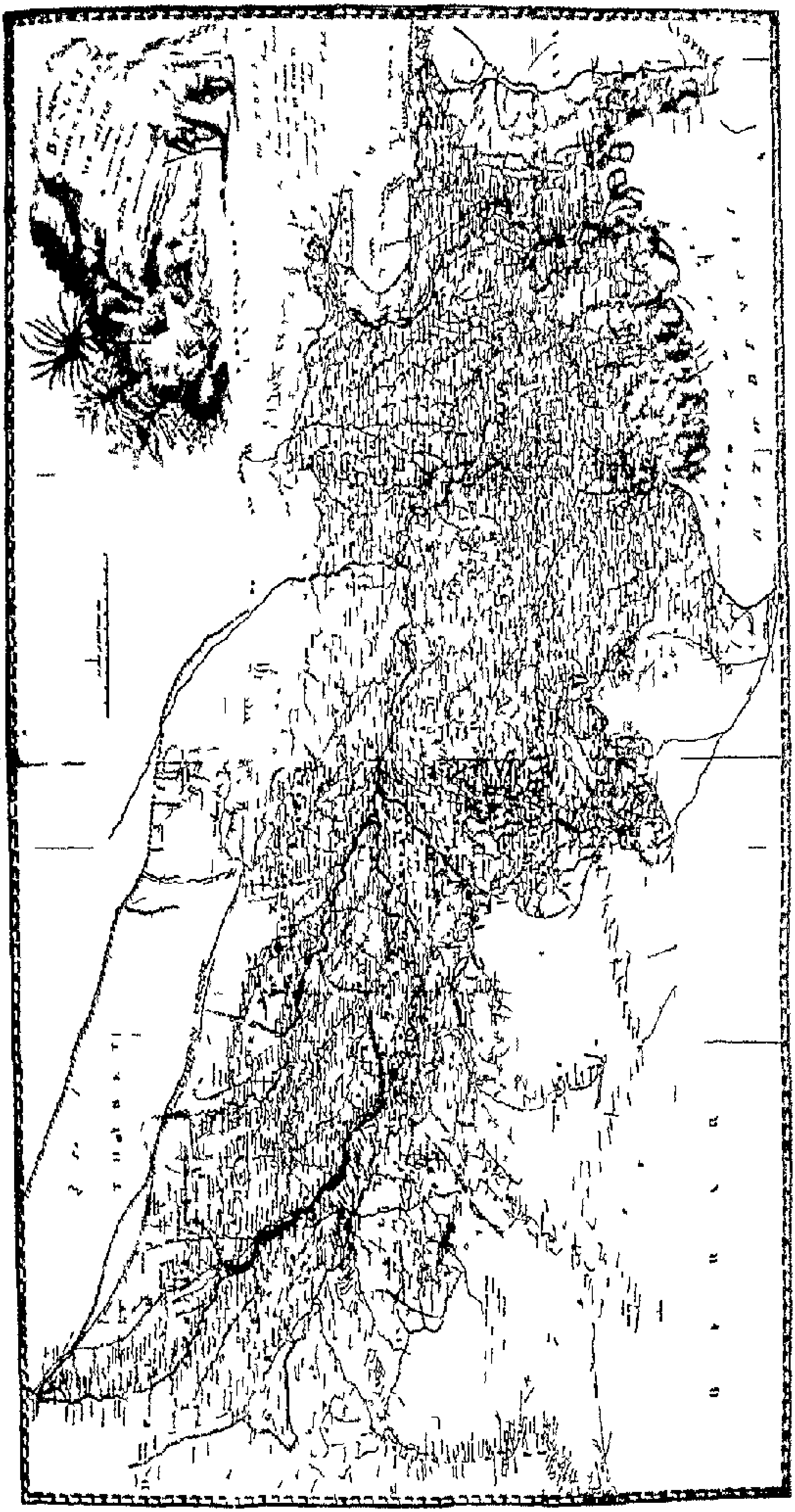
i) A large Chart of part of the Coast of Coromandell from Point Pedro to Armegaon All 53 × 43.5

28 1705 Fer (Nicholas de) Plan de Pondicherry 34.5 × 24
'A Coquart Sculp.'
Another edition 1751 in Beaurain's *Atlas de géographique ancienne et moderne*

29 1705 Fer (Nicholas de) a) Les vrais Indes dites ...Indes orientales
'C. Insulin Sculpt.' In *L'Atlas curieux* 31.5 × 22
b) Presqu'ile de l'Inde deca le Golfe du Gange 8 × 13.5
'Liebaux sculp' (Bibliothèque Nationale, Paris)

30. 1707 Aa (Pierre van der) The following maps are in *Cartes des itineraires et voyages modernes* with Dutch titles and no borders. (Lib. of Congress)

a) Oost-Indize schoepstogt, door Edward Terry, ayt England gedaan, na Suratte, Mogol en Bengale 22.5 × 16



b) T'Ryk van den Grooten Mogol met de grenzen van Cambaya en't koninkryk Deli 23 × 16

c) Oost-Indize voyagie door William Hawkins van Suratte gedaan na't hof van den Grooten Mogol tot Agra 23 × 16

d) De Koninkryken van Guzeratte, Cambaya en Mogol tot aan Bengale en Pegu 23 × 16

e) Het Koninkryk van Guzaratte met d'engte van Cambaya ... door den hr I.B. Lavanha bescheven 23 5 × 16

f) 't Koninkryk van Bengale en landschappen aan de Gangesvloed tussen Mogol en Pegu gelogen 22 5 × 16

g) Het Koninkryk van Bengale en de vloeden die zig ende Ganges ontlasten 23 × 16

h) Indien binnen de Ganges vert oonende de Koninkryken van Golconde, Decan, Bisnagar en grenzen van Mogol 23 × 16

i) De Koninkryken van Golconda, Tanassari, Pegu en Aracan aan de Golf am Bengale 23 5 × 16

Another edition 1714 *Atlas nouveau et curieux,* maps in wide ornamental borders with French titles below

31 1708 Wit (Frederick de) Magni Mogolis Imperium, de Novo Correctum et Divisum 51 × 41 5

In David Mortier's *Atlas Novum*

Other editions in Otten's *Atlas sive geographia compendiosa* 1755 and 1775, and Schenk's *Atlas contractus* 1713

32 1709 Catrou The Empire of the Mogol, from the Memoirs of Mr Manouchi 'I Harris Sculp' 32 × 24 5

In *General History of the Mogol Empire*

33 (1710) Sanson India Vetus intra et extra Ganges 27 5 × 20 5

34 1714 Aa (Pierre van der) In *Nouvel Atlas*

a) Carte du Golfe de Bengale 34 5 × 28

b) Royaume du Grand Mogol 35 × 29

c) Le Golfe de Cambaye et la Rade de Suratte 15 5 × 19

d) L'Inde deça le Gange 29 5 × 22 5

d) is also in *Le Nouveau Théâtre du Monde* 1713 on folio with L'Inde delà le Gange, and in *Galerie Agréable du Monde* 1729 in

a very elaborate border, and in Covens and Mortier's *Nouvel Atlas* 1735 without Aa's name.

In *Atlas Soulagé de son gros et pésant fardeau* appears **Royaume de Bengale** 20 × 14

35. 1717 Moll (Herman) **The West part of India, or the Empire of the Great Mogul** In *Atlas Geographus* 18 × 25.5

Another edition in Salmon's *Modern History* entitled **India or the Empire of the Great Mogul,** page 193

36 1719 Chatêlain (Henry Abraham) In *Atlas Historique*

a) **Carte Nouvelle des Terres de Cucan, de Canara, de Malabar, de Madura et de Corromandel** 43 × 36

b) **Généalogie des Empereurs Mogul** includes **Carte de l'Empire du Mogul** and **Carte nouvelle de Royaume de Cachemire** both 15.5 × 12

In Tome V pages 129 and 110

37. 1720 Keulen (Gerard van) **Nova Tabula Terrarum Cucan, Canara, Malabaria, Madura et Coromandelia** 'Edente Hadrian Relando' 59 × 49

Other editions 1728, 1738, 1744, and in *Zee Fakkel* 1753

38 1723 De l'Isle (Guillaume) **Carte des Côtes de Malabar et de Coromandel** 56 × 43

Many editions including Covens and Mortier 1730 and 1733, Schenk 1740, and Ottens 1775

39. 1726 Valentyn (Francois) In *Ooud en nieuw Oost-Indien*

a) **Nieuwekaart van Choromandel ende Malabar** 58 × 50

b) (Chart of the Coast of Malabar, from Vemony to Caap Comorin) No 15 37 × 29.5

c) **Die Rievier van Suratte** No 9 37 5 × 29

d) **De Kust van Dabul** No. 16B 35 × 26

e) **De Stadt Dabul,** view No 16A 35 5 × 27

f) **Cananoor** No. 17A 37 × 29

g) **Cananoor**, view No. XVII 36 × 27

h) **Grond Teekening van de Fortresse Cranganoor** No. 18 37 × 29

i) De Stad Coetsjien Gelegen op de Cust van Malabar
No 20 36 × 26
j) De Grond Teekening van de Fortresse Ceylan
No 21 37 × 29 5
k) Nieuwe Kaart van't Koninkryk Bengale 54 5 × 44 5
l) (Hoegly) No 7F 36 × 27 5

40 1727 Hamilton (Alexander) A Generall Map of India intra Ganges 'Rot Mylne fe' 19 5 × 31 5
In *A New Account of the East Indies* chap 13

41 1728 Halley (Edmund) In *Atlas Maritimus et commercial*
a) **A Chart of the East Indian Ocean from Cape Guardefoy to Cochin on the Coast of Malabar** 60 × 50
b) **A Chart of the Coast of Coromandel and the Great Bay of Bengal** 57 × 48

42 1729 Aa (Pierre van der) In *Galerie Agreable du Monde*, vol 57
a) **Carte du Golfe du Bengale, mer des Indes, et rivière du Gange, avec les pais et îles d'alentour** 35 5 × 28
b) **Royaume du Grand Mogol** 35 × 29
b) is copied from Baffin's map of 1619

43 1729 Bouchet (Ioan Venantio) **Sud-Theil von Indien Herwerts des Ganges** 23 × 20 5

44 1735 Homann Heirs **Malabar and Coromandell** 48 × 54 5
Other editions in *Grosser Atlas* 1753 and *Atlas Hommanus* 1762, and in Seutter's *Atlas Novus* 1740

45 1740 Seutter (Mathius) **Imperii Mogni Mogolis sive Indici Padschach** 'Albrecht Carl Seutter Sculps' 57 × 39 5
In *Atlas Novus*

46 1740 Bellin (Jaques Nicholas) *Le Petit Atlas Maritime* includes in Tome III
a) **Carte de L'Industan Ie Feuille** No 21 31 × 22
b) **Suite de la Carte de L'Industan IIe Feuille** No 22 17 × 21 5

c) Cartes des Isles Maldives No 23 15×21
d) Carte du Golfe de Cambaye No. 24 17 5×22
e) Plan de Bombay No 25 17×21.5
f) Cartes des Côtes de Concan et Decan No 26 18×21.5
g) Carte de Canara, Suite de la Carte de Malabar, Coste de Malabar No. 27 36×21.5
h) Baye, Ville at Forts d'Andarajapor No 28 17×21
i) Carte du Port de Goa et ses environs No. 29 17 5×21 5
j) Plan de Maye à la Coste de Malabar No 30 17 5×21.5
k) Carte du Golfe de Bengale No. 34 26 5×21.5
l) Plan de la Ville de Pondicheri No. 35 16×20
m) Carte de District de Tranquebar No. 36 17×22
n) Plan de Madras No. 37 17 5×21 5
o) Coste de Coromandell No 38 17.5×23
p) Coste de Coromandell No 39 33×21 5
q) Nouvelle Carte de Royaume de Bengal No 40 33 5×27 5
r) Carte de l'Entrée du Gange No. 41 17×21 5

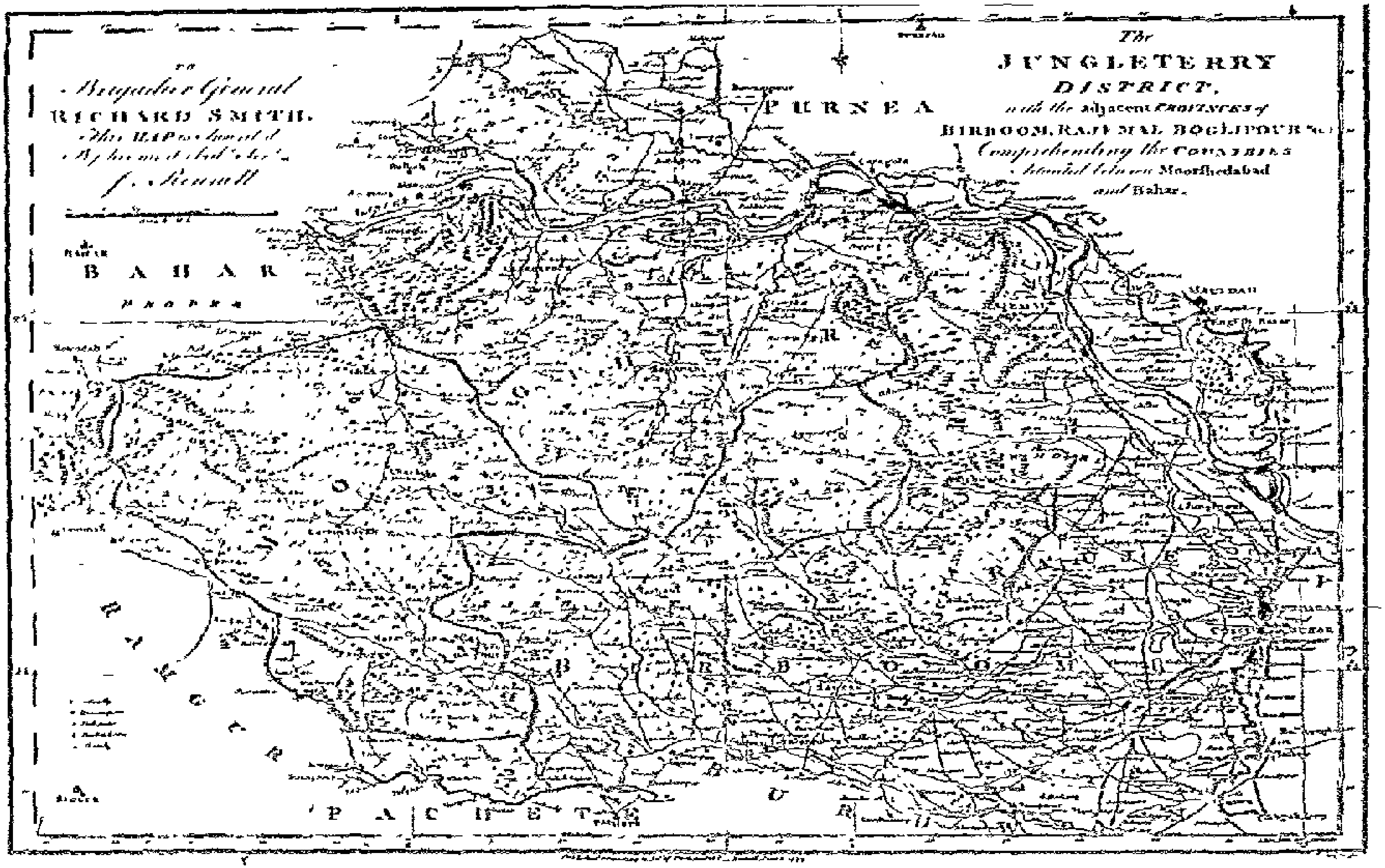
47. 1742 Fraser (James) A map of the Mogul Empire and Part of Tartary In *The History of Nadir Shah* 20×27

48. 1744 Tirion (Isaak) Nieuwekaart van t'Keyzerryk van den Grooten Mogol 'J. Keyser fecit 1730' 36×28 5
In *Nieuwe Hand-Atlas* Another edition after 1769

49 1744 Moll (Herman) A Plan of Fort St George and the City of Madras In Salmon's *Modern History* 19×20

50 1745 Après de Mannevillette In *Le Neptune Oriental* are·
a) (Gusurat, Concan and Decan) 46×61
b) (Coste de Canara et Malabar) 61 5×62
c) Carte Plate qui comprend l'isle de Ceylon et une partie des Costes de Malabar et de Coromandel 88 5×57
d) (Coste de Coromandel) 45×60
e) (Gergelin Orixa Bengal) 64×59.5
f) Carte Plate du Golfe de Bengal 64×59 5

Another edition 1775, reduced in size and redrawn with improved knowledge includes·


The
JUNGLETERRY
DISTRICT,
with the Adjacent PROVINCES of
BIRBOOM, RAJEMAL, BOGLIPOUR &c.
Comprehending the COUNTRIES
Situated between Moorshedabad
and Bahar.
To
Brigadier General
RICHARD SMITH
This MAP is humbly Inscribed
By his most obedient Servant
J. Rennell
PURNEA
BAHAR
PROPER
RAMGUR
PACHETE

g) Carte de la Côte de Guzcrat, de Golfe de Cambaye et des Cotes de Concan et de Canara 66 5 × 48

h) Plan du Port de Bombay 34 × 28

i) as c) above 67 × 48.5

j) Carte Plate qui comprend la Côte de Choromandel et les Côtes de Golconde, d'Oricha et de Bengale 67 × 48 5

k) Carte réduite du Golfe de Bengal 66 × 48

l) Chart of the Northern Part of the Bay of Bengal laid down chiefly from the Surveys made by Bartholomew Plaisted and John Ritchie 59.5 × 46

51. 1747 In Prévost *Histoire Générale des Voyages* are four maps by Bellin:

a) Cartes des Côtes de Perse, Gusarat et Malabar 20 × 24.5

b) Le Golfe de Bengale 27 × 22

c) Carte de l'Indoustan 34 × 23

d) Suite de la carte de l'Indoustan 24 5 × 22

and also the following in Vol IX, 1751

e) Plan de Bombay et de ses environs. 'Tiré de Thornton Hyd Ang' 26 × 19 5

f) Carte de District de Tranquebar 30 5 × 29 5

g) Plan de Madras et du Fort St Georges 41 × 19

h) Théâtre de la Guerre Sur la Coste de Coromandel 24.5 × 32

i) Plan de la Ville de Cochin 27 × 18

j) Vue de Cananor 27.5 × 18

k) Vue de Dabul 27 × 18

l) Nouvelle Carte du Royaume de Bengale 34 × 28

m) Plan de Pondicheri, en 1741 15.5 × 19

52. 1747 Lat (J. de) In *Atlas Portatif* are:

a) Kaarte van de groote Mogol of het Ryk van Indostan 24 × 17

b) Kaarte van Malabar en Coromandel 24 × 17

53 1747 Bowen (Emmanuel) A new and accurate map of the Empire of the Great Mogul, together with India on both sides of the Ganges and the adjacent countries 43 × 34.5
In A Complete System of Geography No. 43

54. 1752 D'Anville (J.B. Bourgignon) Carte de l'Inde Two sheets 103 × 39 and 105 × 48.5

55 1753 D'Anville (J.B B.) a) Coromandel and b) Carnate both 50 × 48

Many editions and amended by Bayly 1769, and in Palairet's *General Atlas* 1775

56. 1753 Keulen (J. van) The *Zee Fakkel* has the following charts:

a) Nieuwe Paskaart van het Noordelijkste Gedeelte van de Golf van Bengalen 59.5 × 51

b) Nieuwe afteenkening van Bombay ... aan de kust van Decan 51.5 × 43

c) de Kust van Coromandel 26 5 × 23.5

d) Nieuwe afteenkening van de Kust van Coromandel 58 × 49.5

e) Pas Caart van een Gedeelte van de Kusten van Cuncanca-nara en Malabar 57 × 50

f) De Modder Bay van Cranganor op de Kust van Malabar 27 × 23.5

g) Het opkommen en Vervolg. van de Rievier de Ganges of Hugleo 57 × 50

h) De Kust van Madure 27 × 23.5

i) Reede van Palieacate 26.5 × 23.5

j) T'Inkomen van de Rivier van Suratte 27.5 × 47.5

57. 1754 Jeffreys (Thomas) The Seat of the War on the Coast of Choromandel 37 × 47

Another edition in R.O. Cambridge *An Account of the War in India* 1761 and 1780

58. 1756 Hinton (J.) A New and accurate Map of Coromandel, Malabar, Bengal, etc, exhibiting the Principal European Settlements in the East Indies 35 × 27

In *Universal Magazine* Aug. 1756

59 1758 Robert (Le Sieur de Vaugondy) Les Indes Orientales ou sont distingués les Empires et Royaumes qu'elles contiennent

In *Atlas Universal* 56.5 × 48.5

60. 1758 Herbert (William) 2nd Edition of *A New Directory for the East Indies* has the following charts.

a) (Bay of Bengal)	90 × 59
b) Coast of India, Guzurat to Goa	45 × 59
c) Coast of Canara and Malabar	60 5 × 61
d) Coast of Malabar and Ceylon	86 5 × 57.5
e) Coast of Coromandel	39.5 × 61
f) Golconda, Orixa and Bengal Coast	57 × 44.5
g) Bay of Bengal	63 × 60

Other editions 1767, 1780, and 1787

61. 1761 Jeffreys (Thomas) In R.O. Cambridge *An Account of the War in India between the English and the French.*

a) The Mogul's Empire divided into its principal Governments, designed for this History Plate I

b) The Seat of the War on the Coast of Choromandel Plate IV

c) The Country round Trichinopoly with the Camps and Marches of the English and French Troops in 1753 and 1754 Plate V

d) A Map of the Kingdom of Madura with the South Coast of Malabar and the countries of Marava, Travancore etc, exhibiting the March of the British Troops into the Tinnevelly Country

e) A Map of the Country inhabited by the Marathas, with the Dominions of Angria Plate VIII

f) The Attack made on Geriah Fort by Rear Admiral Watson on 13th Feb. 1756 and A Plan of Geriah Fort when it surrendered to the British Fleet 13th Feb. 1756 Plate X

g) Plan of Madura Plate VII

h) A Plan of Fort St George, part of the Black Town and the country adjacent as it was when beseiged by the French, 12 Dec. 1758 Plate XII

i) Masulipatam taken by storm by Colonel Forde, 7th April 1759 Plate XIV

j) Plan of the Castle of Surat Plate XV

k) Plan of the Battle of Wandiwash gained over the French by Col. Coote, 22 Jan. 1760 Plate XVII

l) (Chengalaput) Plate XVIII

62 1763 D'Anville (J B B) Partie de l'Inde entre Delhi et Patna 'Amended by M Law de Lauristan' 40 × 20

63 1763 Kitchin (Thomas) A Map of the Coast of Coromandel from the River Godavari to Cape Comorin
In J Nourse *History of the Military Transactions in Indostan*

64 1764 Harris (John) India as described by all authors before the 5th century 31 5 × 22
In *Navigantium atque Itinerarium* Vol I Page 369

65 1764 Nicholson (William) A Reduced Chart of Bombay Harbour
Also in Herbert's *A New Directory* 51 × 53 5

66 1765 D'Anville (J B B) Ad Antiquum Indiae 38 × 36 5

67 1766 Bellin (J N) Carte réduite de la presqu'Isle de l'Inde In *Hydrographie Francaise* Vol II No 96 84 × 60

68 1768 Jeffreys (Thomas) The East Indies with Roads Two sheets
a) (Northern) 137 × 53
b) (Southern) 137 × 53
Other editions 1778 Faden's *General Atlas,* and 1777, 1787, Kitchin's *General Atlas*

69 1770 MBCT Théâtre de la Guerre dans l'Inde sur la coste de Coromandel 93 × 57
West at top of the page, views of towns around the edge

70 1770 Kitchin (Thomas) A New and Accurate Map of the Northern Coast of Choromandel 17 5 × 24 5

71 1772 Bolts (William) Map of the Northern Part of Hindustan, in which the Territories of the British Company, Sujah Dowlah and Shah Alam are drawn from actual surveys 103 × 59

72 1775 A new and Accurate Map of the Seat of the Late War on the Coast of Choromandel in the East Indies 20 × 24
In Rev J Entick's *History of the Late War*

73 1775 Ottens (R and J) **La nouvelle grande carte des Indes Orientales** In three parts 56 × 43
Part three has insets of Carte de Royaume de Conchin, de Coilan et de Cranganor

74 1775 Dalrymple published the following charts in *Plans of Ports in the East Indies*:

a) **A Chart of Broach Bar and River** Lt W A Skinner 1773 21 × 37

b) **Plan of Chaul on the Malabar Coast** From an English MS 1750 21 × 38

c) **Plan of Surat River** From an English MS 1750 21 × 28

d) **Plan and View of Gingerah** A. Werner 21 × 28

e) **Plan of Garriah Harbour** Sir W Hewitt, Bart 1756 21 × 37.5

f) **View and Plan of Sinderoo** Col. John Watson 1765 21 × 28

g) **Plan of Goa Harbour** Reeves Woodson 30 × 29

h) **Plan of Merjee** Elias Bates 1725 21 × 28

i) **Comptee** Elias Bates 1725 21 × 28

j) **Plan of Onore** Elias Bates 1725 21 × 28

k) **Mud Bank of Cranganore** from Van Keulen 19.5 × 28

75. 1776 Rennell (James) **Engraved map of Bengal, Bahar etc. from Benares to Sylhet** Dedicated to the Court of Directors by Andrew Dury Published by Sayer and Bennett with no mention of Rennell's name.

76. 1776 Rennell (James) **A Map of the Eastern Parts of Hindoostan containing the Soubahs or Kingdoms of Bengal, Bahar, Awd and Ellahabad** Eng Wm Whitchurch 83 × 55

77 1776 Rennell (James) **An actual Survey of the Provinces of Bengal, Bahar etc. by James Rennell.** Two sheets tog 'Wm Haddon Sculp' Dedication by A. Dury 150 × 99
Other editions 1786 and 1794

78. 1776 Bonne (Rigobert) In *Atlas Moderne*:

a) Carte de la partie superior de l'Inde en deca du Gange

b) Carte de la partie inferior de l'Inde en deca du Gange
each 41 × 29 5

Reduced editions in Reynal's *Histoire philosophique et politique des établissements et du commerce des européens dans les deux Indes* 1780
each 32 × 21

79. 1777 Rennell (James) A Map of the Provinces of Delhi, Agrah, Oude and Ellahabad 105 × 53
Other editions 1786 and 1794

80. 1778 Barnard (Thomas) A Map of the East India Company's Lands on the Coast of Choromandel... 112 × 58
Publ. A. Dalrymple

81. 1779 Kitchin (Thomas) The East Indies including more particularly the British Dominions on the continent of India In Blair's *Chronology* 56.5 × 42

82. 1779 Rennell (James) *The Bengal Atlas* engraved by W. Harrison has the following maps:
a) Map of the Delta of the Ganges, with the adjacent countries in the East, and a plan of Samookgur 60.5 × 44
b) The Jungleterry District, and adjacent Provinces of Birmbhoom, Rajemal and Boglipoor, comprehending the countries between Moorshedabad and Bahar 42 × 35.5
c) Map of South Bahar 50.5 × 36
d) Map of North Bahar 47 × 33.5
e) The Northern Provinces of Bengal, with Bootan, Morung and Assam Frontiers 60.5 × 35
f) The Lowlands beyond the Ganges, from the Mauldah River to Silhet 62 × 29
g) The Provinces of Bengal, lying on the West of the Hooghly River with the Mahratta Frontier 45 × 37
h) The Conquered Provinces on the South of the Bahar, viz. Ramghur, Palamow, Chota-Nagpur, with their dependencies
38 × 41
i) Map of Bengal and Bahar, comprehending a tract more extensive and Populous than the British Isles 68 × 47

Other editions 1780 with 13 plates, a quarto edition 1781 with 23 folded maps and two folio editions 1781 with unfolded maps, 1783 and later reprints

The later plates are

j) **General Map of Oude and Allahabad, with parts of Agra and Delhi** 52 × 61 5

k) **Map of the Cossimbuzar Island** with inset sketch of the Battle of Plassey 29 × 46

l) **Plan of the Environs of the City of Dacca** 50 × 38

m) **The Doo-ab, from Allahabad to Kalpy** 62 × 24

n-q) Four plates showing the Ganges from Allahabad to confluence with Meghna, and Meghna to Luckia River 54 5 × 25, 64 5 × 26, 60 × 19 5, 61 × 24

r) **The Burrampooter from the head of the Luckia or Banner River to Assam** 60 × 25 5

s) **The Hoogly River from Nuddeah to the sea** 59 5 × 29 5

t) **A Map of the Sunderbund and Balliagot Passages** 71 5 × 30 5

u) **Views of Oudanulla and Chunar Gur**

v) Action of Ganges water on erosion

w) Inland Navigation 37 × 20

83 1781 Lodge (John) **A Map of the Peninsula of India** 26 5 × 37 5
Publ J Bew in *Political Magazine* Vol II

84 1782 Lodge (John) In *Political Magazine*

a) **An accurate map of the Coast of Coromandel from the River Pennar to Pondicherri** 28 × 25

b) **An accurate map of the Coast of Coromandel from St David to Cape Comorin** 24 5 × 32 5

85 1782 Kitchin (Thomas) In Orme's *Historical Fragments of the Mogol Empire*

a) (South India) 39 5 × 29 5

b) (Central India) 38 × 32

c) **According to Mr. Bussy's Marches** I Andrews Sculpt 14 × 16

86. 1782 Rennell (James) Hindoostan 79 5 × 79
Another edition 1785, published with a *Memoir* including:
a) Additions to Berar etc. 24.5 × 17 5
b) A General view of the principal Roads and Divisions of Hindoostan 24 × 24.5
c) The Marches of Colonels Fullarton and Humberstone in the Coimbatore and Nair Countries 1783 31.5 × 22
Enlarged edition 1788

87 1782 Zatta (Antonio) In *Atlante Veneto* Vol. IV G. Pitteri Scr.
a) Indie Ime Foglio 40 × 29
b) Indie IIme Foglio 40 × 28.5
c) Stato del Mogol 40.5 × 31

88. 1786 Kitchin (Thomas) An Accurate Map of Hindostan or India from the best Authorities 41.5 × 39.5
In Guthrie's *A New System of Geography*

89. 1787 Bolts (William) Carte du Bengale et ses dépendences French copy of map of 1772 55 × 37

90. 1788 Rochette (de la) Hind, Hindoostan or India 53 × 69.5

91. 1788 Bernoulli (Johann) In *Déscription de l'Inde* with a translation of Tieffenthaler's MS.
a) Carte Générale du cours du Gange et du Gagra 74 × 59
b) Rennell's General Map of India in three sheets, copied in Berlin by Benj. Glassbach 1785
c) The Ganges from Calliagonga to ... Luckia River 59 × 23.5
d) The Burrampooter from Luckia ... to Assam 58 × 25
e) Portion d'une Carte du Sud de la presquîle de l'Inde P Hans Sc. 52 5 × 40.5

92 1788 Bonne (Rigobert) L'Empire du Mogol, et le presqu'Isle de l'Inde en deça et delà du Gange 24 × 34.5
(Royal Geographical Society)

93 1788 Rennell (James) A Map of the North Part of Hindustan, or

a Geographical Survey of the Provinces of Bengal, Bahar, Awd Ellahabad, Agra and Delhi Two sheets 105.5 × 69

Other editions 1794, and in Kitchin's *A New Universal Atlas* 1799

94. 1788 Rennell (James) The Peninsula of India from the Krishna River to Cape Comorin 60 5 × 76

95. 1791 Faden (William) The Southern countries of India from Madras to Cape Comorin, showing the campaigns of 1782-4 Two sheets

96. 1792 Rennell (James) The Peninsula of India from the Kistnah River to Cape Comorin 43 5 × 49

97 1792 Faden (William) A Map of the Peninsula of India from the 19th degree Northern Latitude to Cape Comorin 81 × 99

Other editions 1795 and 1800

98. 1792 Dalrymple published the following charts in *A Collection of Charts and Plans*

a) Chart of the coast of Guzarat and Scindy 1783 61 × 46 5

b) Chart of the Coasts of Choromandel and Orixa 49 × 61

c) Chart of part of the Coasts of India and Guzarat John McCluer 1788 55 × 67.5

d) Charts of the Malabar Coast ... from Mangalore to Bombay 62 × 46

e) Chart of part of the Malabar Coast and Part of the Laccadives John McCluer 1790 47 × 62

f) Chart of part of the Malabar Coast John McCluer56 × 67.5

g) A Trigonometrical Survey of the Bay of Coringa Michael Topping 58 × 34.5

99. 1792 Dalrymple published the following charts in an *Atlas of Charts and Plans* ·

a) Chart of the Bay of Coche and River Nagor on the Coast of Guzzaratt Charles Massey 23 5 × 28

b) Chart of the Coast of Scindy ... communicated by Henry Pretty 22 × 28

c) Chart of the Coast of Scindy ... in 1760 Mr. Swithin 43.5 × 28.5
d) Chart of the Coast of Guzarat Mr Swithin 1760 15 5 × 28
e) Plan of Gogo M Hunter 26 × 29
f) A Chart of the Coast of India Lt. John Ringrose 48 × 28.5
g) Plan of Nunsaree River John Ringrose 17.5 × 29
h) Plan of Gundivee River John Ringrose 21.5 × 37
i) Plan of Bulsaur River Lt. John Ringrose 29.5 × 28.5
Plan of Omersary River Lt. John Ringrose 13 × 28.5
j) Plan of Collack River John Ringrose 18 × 28.5
k) Plan of Danno River John Ringrose 21.5 × 28.5
l) Plan of Angassea River Lt. John Ringrose 42 × 28.5
m) Plan of Vassava Lt. Edward Harvey 1777 21 × 29
n) Plan of Manhora River in the Island Salset Archibald Blair 21.5 × 53.5
o) Plan of Mayhaur Lt E. Harvey 1777 21.5 × 53.5
p) Plan of the Port of Chaul on the Coast of Concan 48 × 28.5
q) Sketch of Boncout 21.5 × 29
r) An Eye-Draught of Dewgur Harbour Archibald Blair 26 × 29
s) Plan of Vingoria on the Malabar Coast 44 × 28 5
t) Plan of Ramadilly 66 × 28.5
u) Plan of the Island Durmapatan 22 × 28 5
v) Plan of Tellicherry Road Capt. Thomas Lynn 20 × 29
w) Chart of the Coast of Madura from a Dutch MS 30 × 29
x) Plan of Tutucoryn from Van Keulen 20.5 × 29
y) Chart of the Passage between Point Ramen and the Island Ramisseram William Stevens 21 × 28.5
z) Plan of that Part of the Calymere Reef J. Rennell 34 × 28.5
aa) Plan of a shoal between Point Calymere and Negapatam 44 × 28.5
bb) Plan of the Road and Reef of Paleacate and Tegenopatam Reef from Van Keulen 25.5 × 28.5
cc) Plan of Devy Point 18.5 × 29
dd) Chart of Part of the Coast of Choromandel Capt J. Ritchie 45 × 28.5
ee) Plan of Narsipore River Charles Knapton 11 × 29
ff) A Chart of the Bay of Coringah William Stevens 38 5 × 28

gg) Plan of the Road and Harbour of Coringah William Stevens 50.5 × 34

hh) Plan of ... Codgone and Bomeeny Harbour William Helman 26 × 28.5

ii) Plan of Negapatam Road George Trotter 36.5 × 28 5

jj) A Correct Chart ... of Nagore Thomas Dibden 21 × 48 5

kk) Chart of the Coast of Bengal from Putnay to Ramnabad Ramnabad 37 5 × 28 5

ll) Chart of the Mouth of the Megna River 21 × 50

mm) Chart of the Coast of Scindy and Bay of Cutch 28.5 × 29

nn) Chart of Part of the Malabar Coast Lt. John McCluer 23 5 × 30

oo) Plan and View of Searbett Island John McCluer 41.5 × 30.5

pp) Plan and Views of Jaffrabat John McCluer 31 × 28.5

qq) Plan of Bancoot River John McCluer 21.5 × 51 5

rr) Plan of the Bar and Entrance of Bancoot River John McCluer 35 × 28.5

ss) Plan and Views of Demaon John McCluer 22 5 × 28 5

tt) Plan and Views of Diu John McCluer 36.5 × 30.5

uu) Plan and Views of Radjapore River John McCluer 22 × 28.5

vv) General Plan of Malabar Coast James De Funk 60 × 29
Plan of Tellichery P Daser
Survey of Rhandaterra Charles Turner

ww) Entrance of Salt River Oyster Rocks T Maswoll 21 5 × 28 5

xx) Plan of Part of the Malabar Coast from a French MS 23 × 28 5

yy) Plan of Billiapatam River George Maule 23 × 36

100 1794 Rennell (James) A new map of the Jaghir Lands 50 × 69.5
Publ Laurie and Whittle

101 1795 Upjohn (A) Map of the Post Roads through Bengal, Bahar, Orixa, Oude, Allahabad, Agra and Delhi, with the Rates of Postage from Calcutta 41 × 29

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